SLV-999HF/M11HF/M91HF

RMT-V267B/V278/V280

SERVICE MANUAL

US Model

SLV-M11HF/M91HF

Canadian Model

SLV-999HF/M11HF/M91HF

Photo: SLV-M91HF
RMT-V278

SR MECHANISM

Refer to the SERVICE MANUAL of VHS MECHANICAL ADJUSTMENT Ⅵ for MECHANICAL ADJUSTMENTS (9-921-647-11).

SPECIFICATIONS

System

Format
- VHS NTSC standard

Video recording system
- Rotary head helical scanning FM system

Video heads
- Double azimuth four heads

Video signal
- NTSC color, EIA standards

Tape speed
- SP: 33.35 mm/s (1 3/8 inches/s)
- EP: 11.11 mm/s (7/16 inches/s)
- LP: 16.67 mm/s (11/16 inches/s), playback only

Maximum recording/playback time
- 8 hrs. in EP mode (with T-160 tape)

Fast-forward and rewind time
- Approx. 1 min. (with T-120 tape)*

* The time may vary according to the brand and/or type of tape or the operating condition of the VCR.

Tuner section

Channel coverage
- VHF 2 to 13
- UHF 14 to 69
- CATV A-8 to A-1, A to W, W+1 to W+84

Antenna
- 75-ohm antenna terminal for VHF/UHF

Inputs and outputs

LINE-1 IN and -2 IN
- VIDEO IN, phono jack (1 each)
- Input signal: 1 Vp-p, 75 ohms, unbalanced, sync negative
- AUDIO IN, phono jacks (2 each)
- Input level: 327 mVrms
- Input impedance: more than 47 kilohms

LINE OUT
- VIDEO OUT, phono jack (1)
- Output signal: 1 Vp-p, 75 ohms, unbalanced, sync negative
- AUDIO OUT, phono jacks (2)
- Standard output: 327 mVrms
- Load impedance: 47 kilohms
- Output impedance: less than 10 kilohms

S-LINK (CONTROL S IN)
- Minijack (1)

CABLE BOX CONTROL (CONTROL S OUT)
- Stereo mini jack (plug in power) (1)

CPD IN (M11HF/M91HF only)
- Minijack (1)

Timer section

Clock
- Quartz locked

Timer indication
- 12-hour cycle

Timer setting
- 8 programs per month (max.)

Power back-up
- Built-inself-charging capacitor
- Back-up duration: up to 1 hour at a time

General

Power requirements
- 120 V AC, 60 Hz

Power consumption
- 35 W

Operating temperature
- 5°C to 40°C (41°F to 104°F)

Storage temperature
- – 20°C to 60°C (– 4°F to 140°F)

Dimensions
- Approx. 430 × 100 × 281 mm (w/h/d)
- Approx. (17 × 4 × 11 1/8 inches) including projecting parts and controls

Mass
- Approx. 4.6 kg (10 lb 2 oz) (M11HF/M91HF)
- Approx. 4.3 kg (9 lb 8 oz) (999HF)

Supplied accessories

Remote commander (1)
Size AA (R6) batteries (2)
75-ohm coaxial cable with F-type connectors (1)
Audio/video cable (3-phono, 1-mini to 3-phono, 1-mini) (1)
Monaural cable (1-mini to 1-mini) (1) (M11HF/M91HF only)
Cable Mouse (cable box controller) (1)
SmartFile labels (5) (M11HF/M91HF only)

Design and specifications are subject to change without notice.

VIDEO CASSETTE RECORDER

MICROFILM

SONY

SAFETY CHECK-OUT

After correcting the original service problem, perform the following safety checks before releasing the set to the customer.

1. Check the area of your repair for unsoldered or poorly-soldered connections. Check the entire board surface for solder splashes and bridges.
2. Check the interboard wiring to ensure that no wires are "pinched" or contact high-wattage resistors.
3. Look for unauthorized replacement parts, particularly transistors, that were installed during a previous repair. Point them out to the customer and recommend their replacement.
4. Look for parts which, though functioning, show obvious signs of deterioration. Point them out to the customer and recommend their replacement.
5. Check the line cord for cracks and abrasion. Recommend the replacement of any such line cord to the customer.
6. Check the B+ voltage to see it is at the values specified.
7. Check the antenna terminals, metal trim, "metallized" knobs, screws, and all other exposed metal parts for AC leakage. Check leakage as described below.

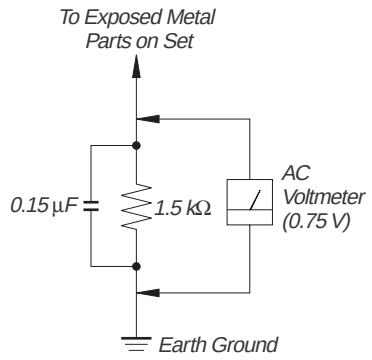

Fig. A. Using an AC voltmeter to check AC leakage.

LEAKAGE TEST

The AC leakage from any exposed metal part to earth ground and from all exposed metal parts to any exposed metal part having a return to chassis, must not exceed 0.5mA (500 microampers). Leakage current can be measured by any one of three methods.

1. A commercial leakage tester, such as the Simpson 229 or RCA TW-540A. Follow the manufacturers' instructions to use these instruments.
2. A battery-operated AC milliammeter. The Data Precision 245 digital multimeter is suitable for this job.
3. Measuring the voltage drop across a resistor by means of a VOM or battery-operated AC voltmeter. The "limit" indication is 0.75V, so analog meters must have an accurate low voltage scale. The Simpson 250 and Sanwa SH-63Trd are examples of a passive VOM that is suitable. Nearly all battery operated digital multimeters that have a 2V AC range are suitable. (See Fig. A)

SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY MARK ⚠ OR DOTTED LINE WITH MARK ⚠ ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

ATTENTION AU COMPOSANT AYANT RAPPORT À LA SÉCURITÉ!

LES COMPOSANTS IDENTIFÉS PAR UNE MARQUE ⚠ SUR LES DIAGRAMMES SCHÉMATIQUES ET LA LISTE DES PIÈCES SONT CRITIQUES POUR LA SÉCURITÉ DE FONCTIONNEMENT. NE REMPLACER CES COMPOSANTS QUE PAR DES PIÈSES SONY DONT LES NUMÉROS SONT DONNÉS DANS CE MANUEL OU DANS LES SUPPÉMENTS PUBLIÉS PAR SONY.

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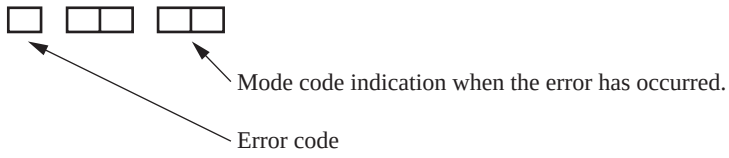
1. ERROR CODE INDICATION

- Error codes are indicated using the lower 5 digits in the fluorescent display tube.
  "At this time, Colon ":" between character is not indicated."



ERROR CODE

0	No error
1	Cam encoder error Loading direction
2	Cam encoder error Unloading direction
3	T reel error
4	S reel error
5	Capstan error
6	Drum error
7	Error on initializing
8	Cassette loading error
9	Reserve

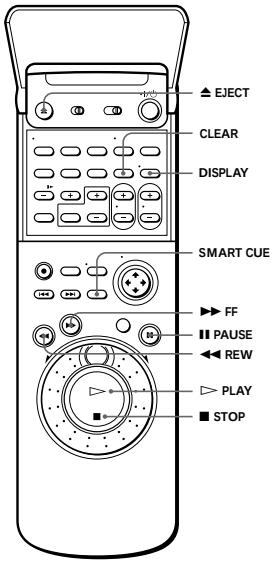
MODE CODE

0	Power-on eject	10	FWD x1	20	REW play
1	Power-on initial	11	FWD x2	21	Cas. loading
2	Power-off eject	12	CUE	22	Tape loading
3	Power-off stop	13	PB-pause	23	Power-off loading
4	FF	14	RVS-pause	24	Mecha. error (Power on)
5	REW	15	RVS x1	25	Power-on eject initial
6	REC	16	RVS x2	26	Power-off eject initial
7	REC- pause	17	REV	27	APC REC
8	Power-on stop	18	Power-off initial	28	Cas. loading
9	PB	19	Mecha. error (Power off)		(No auto PB check)

SECTION 1
GENERAL

This section is extracted from instruction manual. (SLV-M91HF model)

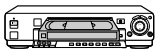
Playing a tape



1 Turn on your TV and set it to the video channel.

2 Insert a tape.

The VCR turns on and starts playing automatically if you insert a tape with its safety tab removed.



3 PLAY ▷

Press ▷ PLAY.

When the tape reaches the end, it will rewind automatically.

Additional tasks

To	Press
Stop play	■ STOP
Pause play	❚❚ PAUSE
Resume play after pause	❚❚ PAUSE or ▷ PLAY
Fast-forward the tape	▶▶ FF during stop
Rewind the tape	◀◀ REW during stop
Eject the tape	⏏ EJECT

To skip playback

You can skip a portion of playback you don't want to watch such as a commercial and restart playback by pressing a single button.

1 Press SMART CUE during playback of the scene you want to skip. The VCR starts searching.

2 Press SMART CUE again when you find the scene you want to watch. The VCR stops searching, rewinds a few seconds, then resumes normal playback.

If you press and hold SMART CUE while the VCR is skip searching, the VCR will stop searching, and continue rewinding until you release SMART CUE.

Tip

- You can change the length of rewinding time on the ADVANCED OPTIONS menu. For details, see page 33.

To use the time counter

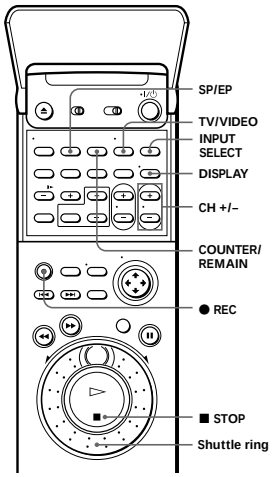
At the point on the tape that you want to find later, press CLEAR. The counter in the display window resets to "0:00:00". Search for the point afterwards by referring to the counter.

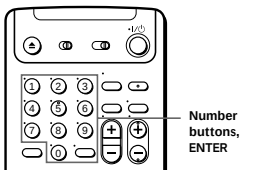
To display the counter on the TV screen, press DISPLAY.

Notes

- Tapes recorded in the LP mode on other VCRs can be played back on this VCR but the picture quality cannot be guaranteed.
- The counter resets to "0:00:00" whenever a tape is reinserted.
- The counter stops counting when it comes to a portion with no recording.

Recording TV programs





1 Turn on your TV and set it to the video channel.

To record from a cable box, turn it on.

2 Insert a tape with its safety tab in place.

3 INPUT SELECT

Press INPUT SELECT until a channel number appears in the display window.

4 • CH +/–

Press CH +/– to select the channel you want to record.

5 SP / EP

Press SP/EP to select the tape speed, SP or EP.

EP (Extended Play) provides recording time three times as long as SP (Standard Play), however, SP produces better picture and audio quality.

6 REC ●

Press ● REC to start recording.

The recording indicator lights up red in the display window.

Recording indicator

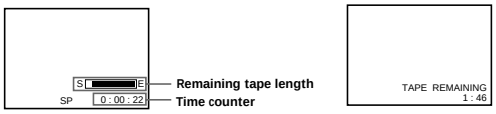
To stop recording

Press ■ STOP.

continued

To check the remaining tape length

Press DISPLAY. The white bar indicates the approximate length of tape remaining. With the display on, press COUNTER/REMAIN to check the remaining time. Each time you press COUNTER/REMAIN, the time counter and the remaining tape length appear alternately. The remaining tape length with the ⏲ indicator also appears in the display window.



To check the remaining tape length of a T-140 or T-180 tape, set TAPE SELECT in the ADVANCED OPTIONS menu to 180. (For details, see page33.)

To watch another TV program while recording

1. Press TV/VIDEO to turn off the VIDEO indicator in the display window.
2. If the TV is connected to the VCR's LINE OUT jacks, set the TV to TV input; if not, skip this step.
3. Select another channel on the TV.

To select the channel using the shuttle ring

To select a channel in step 4 above, you can also use the shuttle ring. During stop, turn the shuttle ring clockwise for higher channels or counterclockwise for lower channels. The VCR switches the channel in the preset order.

To save a recording

To prevent accidental erasure, break off the safety tab as illustrated. To record on a tape again, cover the tab hole with adhesive tape.

Tips

- To select a channel, you can use the number buttons on the remote commander. Enter the channel number, then press ENTER.
- You can select a video source from the LINE-1 IN or LINE-2 IN jacks using the INPUT SELECT button.
- "L3" is reserved for LASER LINK input when viewing the camcorder picture (page35). Cable connection is recommended when recording the picture from the camcorder (page 38).
- The display appears on the TV screen indicating information about the tape, but the information won't be recorded on the tape.
- If you don't want to watch TV while recording, you can turn off the TV. When using a cable box, make sure to leave it on.
- You can set the channel with the shuttle ring during stop. However, you cannot set the channel with the shuttle ring on the remote commander when:
  – you set CABLE MOUSE in the CABLE BOX CONTROL menu to ON.
  – you press JOG so that the remote commander is in jog mode.

Notes

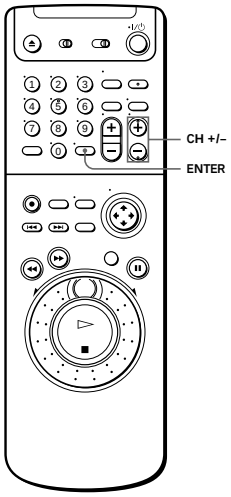
- The remaining tape length may not be indicated accurately for short tapes such as T-20 or T-30, or tapes recorded in the LP mode.
- The display does not appear during still (pause) mode or slow-motion playback.
- It may take up to one minute for the VCR to calculate and display the remaining tape length after you press DISPLAY.

Locating a channel by Station ID

You can select the TV program from station ID.

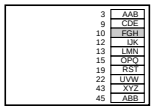
Before you start...

- Set FAVORITE CH to OFF in the ADVANCED OPTIONS menu (page33).

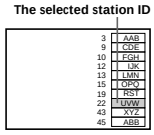


1 Turn on your TV and set it to the video channel.
To record from a cable box, turn it on.

2 • ENTER
Press ENTER.
The station ID appears on the TV screen.



3 • CH
Press CH +/– to select the station ID you want.



4 • ENTER
Press ENTER.

Note

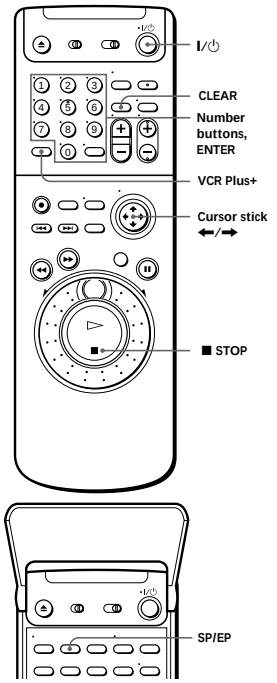
- If the TV channel has no station ID, the channel number appears on the TV screen.

Recording TV programs using the VCR Plus+ GOLD system

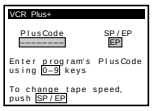
Just enter the PlusCode number listed in the TV program guide. The date, time and channel number of that program are set automatically. You can preset up to eight programs at a time.

Before you start...

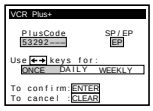
- Check that the VCR clock is set to the correct time.
- Turn on your TV and set it to the video channel. When using a cable box, turn it on.
- Insert a tape with its safety tab in place. Make sure the tape is longer than the total recording time.
- If you insert a tape with the SmartFile function, make sure the total recording time doesn't overlap the protected program. For details about the SmartFile function, see page 42.



1 VCR Plus+ Press VCR Plus+.

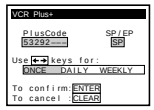


2 Press the number buttons to enter the PlusCode number.

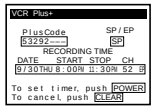


CLEAR If you make a mistake, press CLEAR and re-enter the correct number.

3 SP/EP Press SP/EP to select the tape speed, SP or EP.



4 • CURSOR PUSH OK • ENTER Move the cursor stick ⬅/➡ to select ONCE, DAILY, or WEEKLY, then press ENTER:



To record	Select
Only once	ONCE
Everyday Monday to Friday	DAILY
Once a week	WEEKLY

CLEAR The date, start and stop time, channel number and tape speed appear on the TV screen. If the information is not correct, press CLEAR to cancel the setting.

5 To enter another setting, repeat steps 1 to 4.

6 • I/⏻ Press I/⏻ to turn off the VCR.

The ⏲ indicator appears in the display window and the VCR stands by for recording. When using a cable box, leave it on.

To stop recording

To stop the VCR while recording, press ■ STOP.

continued

Recording TV programs using the VCR Plus+ GOLD system (continued)

To use the VCR after setting the timer

To use the VCR before a timer recording begins, just press I/⏻. The ⏲ indicator disappears from the display window and the VCR switches on. Remember to press I/⏻ to reset the VCR to the timer recording standby mode after using the VCR.

You can also do the following tasks while the VCR is recording:

- Reset the counter.
- Display tape information on the TV screen.
- Check the timer settings.
- Watch another TV program.

To lock the VCR after setting the timer (Child Lock)

While the VCR turns on, hold down I/⏻ POWER on the VCR until the 🔑 indicator appears in the display window. The VCR turns off and the 🔑 indicator remains lit. The VCR will not work except for timer recording.

To unlock the VCR, hold down I/⏻ POWER on the VCR until the 🔑 indicator disappears from the display window. The VCR is unlocked and turns on.

To stop timer recording while the VCR is locked, press ■ STOP. The recording stops and the VCR is unlocked.

Tips

- To cancel the VCR Plus+ GOLD system recording, press VCR Plus+ before pressing ENTER in step 4 above.
- When you are recording a program in the SP mode and the remaining tape becomes shorter than the recording time, the tape speed is automatically changed to the EP mode. Note that some noises will appear on the picture when the tape speed is changed. If you want to keep the tape speed, set AUTO TAPE SPEED to OFF in the ADVANCED OPTIONS menu (page 33).
- When a tape with a SmartFile label attached is inserted, the AUTO BLANK SEARCH screen appears after step 5. Wait about ten seconds for the screen to appear before pressing the I/⏻ button in step 6. For details, see "Setting timer recording in the Blank Time space" (page50).

Notes

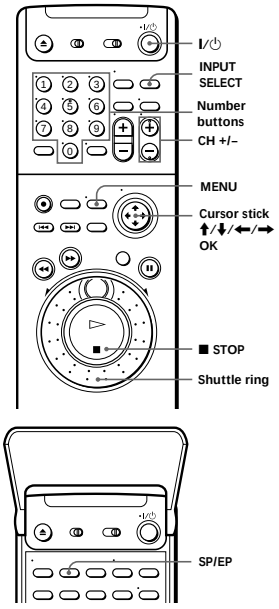
- If the VCR does not accept the PlusCode number, this means that:
  - The PlusCode number is incorrect.
  - ONCE, DAILY, or WEEKLY was selected incorrectly. You cannot select DAILY or WEEKLY for a program that airs more than seven days ahead.
- The VCR will be unlocked when:
  - you stop timer recording by pressing ■ STOP
  - you insert a tape
  - the AC power cord is disconnected or power supply stops.

Setting the timer manually

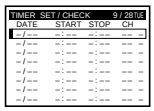
If the VCR Plus+ GOLD system is not available in your area, follow the instructions below to set the timer to record programs.

Before you start...

- Check that the VCR clock is set to the correct time.
- Turn on your TV and set it to the video channel. When using a cable box, turn it on.
- Insert a tape with its safety tab in place. Make sure the tape is longer than the total recording time.
- If you insert a tape with the SmartFile function, make sure the total recording time doesn't overlap the protected program. For details about the SmartFile function, see page 42.



1 • MENU • CURSOR PUSH OK Press MENU, then move the cursor stick ⬆/⬇ to select TIMER SET/CHECK and push the cursor stick (OK).



continued

Setting the timer manually (continued)

2 • CURSOR

PUSH OK

Move the cursor stick ↑/↓ to select the line that is to be set.

3 • CURSOR

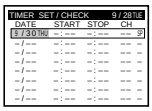
PUSH OK

Set the date, start and stop time, channel number and tape speed:

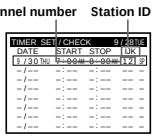
1 Move the cursor stick → to highlight each item in turn.

2 Move the cursor stick ↑/↓ to set each item.

To correct a setting, move the cursor stick ← to return to that setting and reset.



When you set the channel number, the station ID appears on the TV screen. You can set it while checking the station ID.



To record the same program every day or the same day every week, move the cursor stick ↓ while the date is highlighting. For details, see "Daily/weekly recording" below.

INPUT SELECT

To record from a source connected to the LINE-1 IN or LINE-2 IN jacks, press INPUT SELECT to display "LINE1" or "LINE2" in the "CH" position.

4 • CURSOR

PUSH OK

Move the cursor stick → to confirm the setting.

The cursor appears at the beginning of the line. To enter another setting, select the next line and repeat step 3.

5 • CURSOR

PUSH OK

Push the cursor stick (OK).

Setting the timer manually (continued)

Tips

- To set the channel, you can also use the CH +/– or number buttons.
- You can set the channel with the shuttle ring during stop. However, you cannot set the channel with the shuttle ring on the remote commander when:
  – you set CABLE MOUSE in the CABLE BOX CONTROL menu to ON.
  – you press JOG so that the remote commander is in jog mode.
- To set the tape speed, you can also use the SP/EP button.
- When you are recording a program in the SP mode and the remaining tape becomes shorter than the recording time, the tape speed is automatically changed to the EP mode. Note that some noises will appear on the picture when the tape speed is changed. If you want to keep the tape speed, set AUTO TAPE SPEED to OFF in the ADVANCED OPTIONS menu (page 33).
- "LINE3" is reserved for LASER LINK input when viewing the camcorder picture (page35). Cable connection is recommended when recording the picture from the camcorder (page 38).
- When a tape with a SmartFile label attached is inserted, the AUTO BLANK SEARCH screen appears after closing the menu in step 5. For details, see "Setting timer recording in the Blank Time space" (page50).

Notes

- If you are using cable box control, you cannot select "LINE1", "LINE2" or "LINE3".
- The station ID appears on the TV screen only when you complete Smart Channel Mapping and the VCR receives the program information signal (see page 54 of the supplied hookup/setup manual).

6 • I/⏻

Press I/⏻ to turn off the VCR.

The ⏲ indicator appears in the display window and the VCR stands by for recording. When using a cable box, leave it on.

To stop recording

To stop the VCR while recording, press ■ STOP.

Daily/weekly recording

In step 3 above, move the cursor stick ↓ to select the recording pattern. Each time you move the cursor stick ↓, the indication changes as shown below. Move the cursor stick ↑ to change the indication in reverse order.

the current date → SUN-SAT → MON-SAT → MON-FRI → EVERY SAT → ..... → EVERY MON → EVERY SUN → 1 month later → (date counts down) → the current date

To use the VCR after setting the timer

To use the VCR before a timer recording begins, just press I/⏻. The ⏲ indicator disappears from the display window and the VCR switches on. Remember to press I/⏻ to reset the VCR to the timer recording standby mode after using the VCR.

You can also do the following tasks while the VCR is recording:

- Reset the counter.
- Display tape information on the TV screen.
- Check the timer settings.
- Watch another TV program.

To lock the VCR after setting the timer (Child Lock)

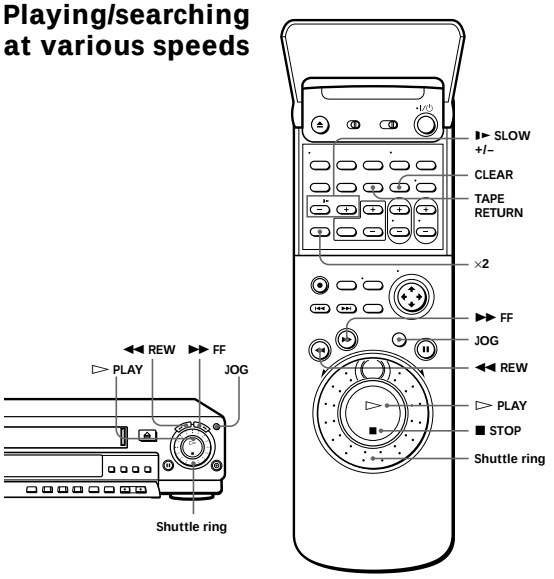
While the VCR turns on, hold down I/⏻ POWER on the VCR until the 🔑 indicator appears in the display window. The VCR turns off and the 🔑 indicator remains lit. The VCR will not work except for timer recording.

To unlock the VCR, hold down I/⏻ POWER on the VCR until the 🔑 indicator disappears from the display window. The VCR is unlocked and turns on.

To stop timer recording while the VCR is locked, press ■ STOP. The recording stops and the VCR is unlocked.

continued

Playing/searching at various speeds



Playback options	Operation
View the picture during fast-forward or rewind	During fast-forward, hold down ▶▶ FF. During rewind, hold down ◀◀ REW.
Search forward	During playback, press ▶▶ FF.
Search backward	During playback, press ◀◀ REW.
Play at twice the normal speed	During playback, press ×2.
Play in slow motion	During playback or pause, press I► SLOW +/–. Press the +/– buttons to change the speed.

continued

Playing/searching at various speeds (continued)

Playback options	Operation
Replay a scene	During playback, first press CLEAR when you come to a scene you want to replay later. When you are ready to replay the scene, press ■ STOP. Then press TAPE RETURN and ▷ PLAY in quick succession.
Rewind and start play	During stop, press ▷ PLAY on the VCR while holding down ◀◀ REW on the VCR.

To resume normal playback

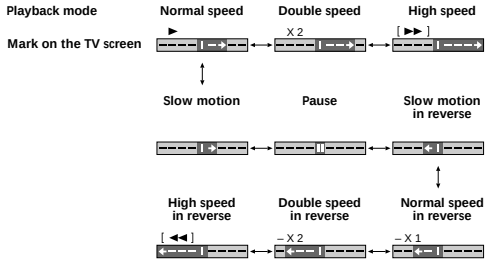
Press ▷ PLAY.

Using the shuttle ring

With the shuttle ring, you can operate a variety of playback options. There are two ways for using the shuttle ring, normal mode and jog mode.

To use the shuttle ring in normal mode

During playback or pause, turn the shuttle ring clockwise or counterclockwise. Each change in the shuttle ring position changes the playback mode, and the corresponding mark appears on the TV screen for a few seconds in the following way if the on-screen display function is on:



To use the shuttle ring in jog mode

Use this mode for frame-by-frame playback.

Press JOG to enter the jog mode. The JOG button lights up. If you change to the jog mode during any playback mode, the playback pauses so you can see a still picture. Each change in the shuttle ring position shifts the picture one frame. To shift frames in reverse, turn the shuttle ring counterclockwise. The frame shift speed depends on the speed you turn the shuttle ring. To resume normal mode, press JOG again. The JOG button goes off.

Tip

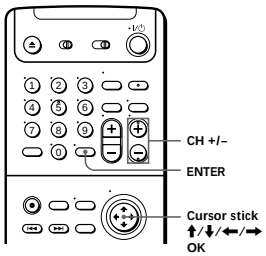
- Adjust the picture using the TRACKING +/– buttons if:
  - Streaks appear while playing in slow motion.
  - The picture shakes while pausing.

  To set tracking to the center position, press both buttons (+/–) at the same time.

Notes

- The sound is muted during these operations.
- Tapes recorded in the LP mode on other VCRs can be played back on this VCR but the picture quality cannot be guaranteed.
- The picture may have snow:
  - when playing at high speed in reverse
  - when playing in reverse slow motion
  - when playing in reverse
- If the playback mode mark doesn't appear on the TV screen, press DISPLAY.
- The picture may flutter a bit when playing in slow motion.

Creating a favorite channel list with Station ID



You can create your favorite channel list of the TV channels with station ID. You can store up to 10 channels with station ID and select the channel from your favorite channel list.

Before you start...

- Set FAVORITE CH to ON in the ADVANCED OPTIONS menu (page33).

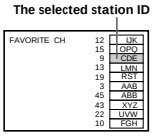
Creating your favorite channel list

1 Press ENTER.

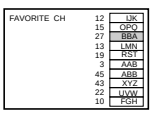
The FAVORITE CH screen appears on the TV screen.

2 Press CH +/– to select the station ID you want to replace.

You can also use the cursor stick ↑/↓ instead.



3 Move the cursor stick ←/→ to select the station ID you want to set.



4 Repeat steps 2 and 3 to set the station IDs as required.

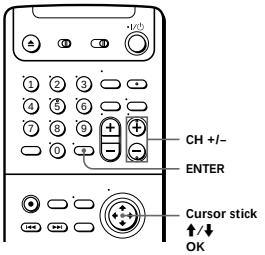
5 Press ENTER.

You can also use the cursor stick (OK) instead.

Note

- If the TV channel has no station ID, the channel number appears on the TV screen.

Selecting a channel from your favorite channel list

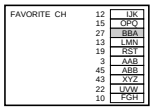


1 Turn on your TV and set it to the video channel.

To choose a channel from a cable box, turn the cable box on.

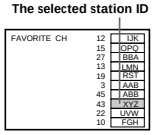
2 Press ENTER.

Your FAVORITE CH screen appears on the TV screen.



3 Press CH +/– to select the station ID you want.

You can also use the cursor stick ↑/↓ instead.



4 Press ENTER.

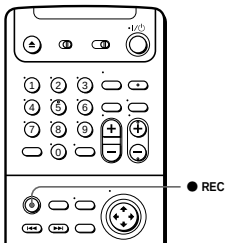
You can also use the cursor stick (OK) instead.

Note

- If the TV channel has no station ID, the channel number appears on the TV screen.

Setting the recording duration time

After starting recording in the normal way, you can have the VCR stop recording automatically after a specified duration.

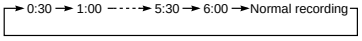


1 While recording, press ● REC.

The ◴ indicator appears in the display window.

2 Press ● REC repeatedly to set the duration.

Each press advances the time in increments of 30 minutes.



The tape counter decreases minute by minute to 0:00, then the VCR stops recording and turns off automatically.

To extend the duration

Press ● REC repeatedly to set a new duration.

To cancel the duration

Press ● REC repeatedly until the ◴ indicator disappears and the VCR returns to normal recording mode.

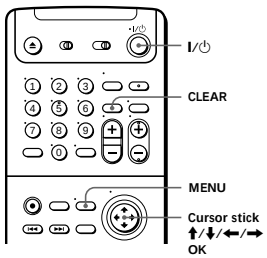
To stop while recording

Press ■ STOP.

Note

- You cannot display the current tape time in the display window when setting the recording duration.

Checking/ changing/ canceling timer settings

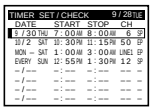


Before you start...

- Turn on your TV and set it to the video channel.

1 Press I/⏻ to turn on the VCR.

2 Press MENU, then move the cursor stick ↑/↓ to select TIMER SET/CHECK and push the cursor stick (OK).


TIMER SET/CHECK 9/28
DATE START STOP CH
9/30 THU 7:00AM 8:00AM 6 SP
11/2 SAT 11:30AM 11:15PM 50 SP
MON-SAT 1:00AM 3:00AM LINE1 SP
EVERY SUN 12:55PM 1:30PM 12 SP

- If you want to change a setting, go on to the next step.
- If you do not need to change the settings, push the cursor stick (OK), then turn off the VCR to return to recording standby.

3 Move the cursor stick ↑/↓ to select the setting you want to change or cancel:

- To change the setting, move the cursor stick ←/→ to highlight the item you want to change, and move the cursor stick ↑/↓ to reset it. Then, move the cursor stick → repeatedly until the cursor appears at the beginning of the line.
- To cancel the setting, press CLEAR.

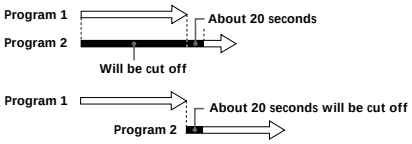
4 Push the cursor stick (OK).

If any timer settings remain, turn off the VCR to return to recording standby.

continued

When the timer settings overlap

The program that starts first has priority and the second program starts recording only after the first program has finished. If the programs start at the same time, the program listed first in the menu has priority.



Recording stereo and bilingual programs

Recording stereo programs

This VCR automatically receives and records stereo programs. When a stereo program is received, the STEREO indicator lights up. If there is noise in the stereo program, set AUTO STEREO in the ADVANCED OPTIONS menu to OFF. The sound will be recorded in monaural (on both hi-fi and normal audio tracks) but with less noise. For details, see page 32.

Recording bilingual programs

Normally, this VCR records only the main sound. When a SAP (Second Audio Program) is received, the SAP indicator lights up. To record only SAP sound, set TUNER AUDIO in the ADVANCED OPTIONS menu to SAP. For details, see page 33.

Selecting the sound during playback

Press AUDIO MONITOR to select the sound you want. (The sound being recorded will not change.)

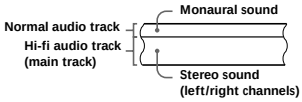
To listen to	On-screen display	Display window
Stereo	STEREO	STEREO
Left channel	LEFT CH	STEREO
Right channel	RIGHT CH	STEREO
Monaural sound on the normal audio track	No indicator	No indicator

continued

Recording stereo and bilingual programs (continued)

How sound is recorded on a video tape

The VCR records sound onto two separate tracks. Hi-fi audio is recorded onto the main track along with the picture. Monaural sound is recorded onto the normal audio track along the edge of the tape.

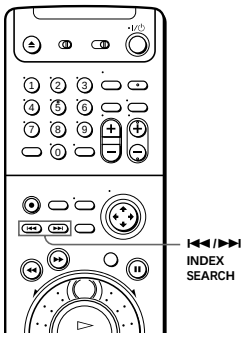


Notes

- To play a tape in stereo, you must use the A/V connections.
- When you play a tape recorded in monaural, the sound is heard in monaural regardless of the AUDIO MONITOR setting.
- If the AUDIO MONITOR button does not function, check that AUDIO MIX in the ADVANCED OPTIONS menu is set to OFF.

Searching using the index function

The VCR marks the tape with an index signal at the point where each recording begins. Use these signals as references to find a specific recording. The VCR can search up to 99 index signals ahead of or behind the current position.

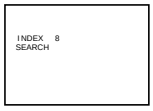


1 Insert an indexed tape into the VCR.

2 Press I◀◀ / ▶▶I INDEX SEARCH repeatedly to specify how many index signals ahead or behind you want to search:

- To search ahead, press ▶▶I INDEX SEARCH.
- To search backwards, press I◀◀ INDEX SEARCH.

The VCR starts searching and the index number on the TV screen counts down to zero. Playback starts automatically from that point.



To stop searching

Press ■ STOP.

Note

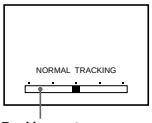
- No index signal will be added when recording starts from recording pause. However, an index signal will be marked if you change the program position during recording pause.

Adjusting the picture

Adjusting the tracking

Although the VCR automatically adjusts the tracking when playing a tape (the ▨ indicator flashes in the display window, then goes off), distortion may occur if the tape was recorded in poor condition. In this case, manually adjust the tracking.

Press the TRACKING +/– buttons to display the tracking meter. The distortion should disappear as you press one of the two buttons (the ▨ indicator lights up). To resume automatic tracking adjustment, eject the tape and reinsert it.



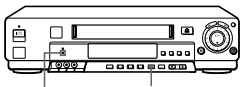
Tracking meter

About the Reality Regenerator function

The Reality Regenerator function automatically restores the picture to its original quality during playback.

To use the Reality Regenerator function, press REALITY REGENERATOR. The REALITY REGENERATOR indicator lights up.

To turn it off, press REALITY REGENERATOR. The REALITY REGENERATOR indicator goes off.



REALITY REGENERATOR

REALITY REGENERATOR indicator

About the Adaptive Picture Control (APC) function

The Adaptive Picture Control (APC) function automatically improves recording and playback quality by adjusting the VCR to the condition of the video heads and tape. To maintain better picture quality, we recommend that you set APC to ON in the ADVANCED OPTIONS menu (with the APC indicator in the display window lit). For details, see page 33.

APC playback

The APC function automatically works on all types of tapes, including rental tapes and tapes that were not recorded with APC.

APC recording

Whenever you insert a tape and first start recording, the VCR adjusts to the tape using the APC function (the APC indicator flashes rapidly). This adjustment is retained until the tape is ejected.

Notes

- The automatic tracking adjustment cannot be guaranteed to work with tapes recorded in the LP mode on other VCRs.
- The APC function does not work if the tape speed is automatically changed from the SP to EP mode during a timer recording when AUTO TAPE SPEED is set to ON in the ADVANCED OPTIONS menu, unless the tape has been recorded in the EP mode with the APC function.
- There is a delay of about ten seconds before the VCR actually starts recording while the VCR analyzes the tape. To avoid the delay, first set the VCR to recording pause (the APC indicator flashes slowly) and press ● REC to have the VCR analyze the tape (the APC indicator flashes rapidly). After the APC indicator stops flashing, press ❚❚ PAUSE to start recording immediately.
  If you want to start recording quickly without using the APC function, first set the VCR to recording pause (the APC indicator flashes slowly) and press ❚❚ PAUSE to start recording.

Changing menu options

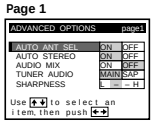
1 Press MENU, then move the cursor stick ↑/↓ to select ADVANCED OPTIONS and push the cursor stick (OK).

2 Move the cursor stick ↑/↓ to select the option to change, then move the cursor stick ←/→ to change the setting.

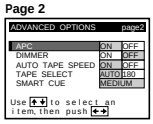
The ADVANCED OPTIONS menu has 3 pages. Moving the cursor stick ↑/↓ repeatedly will turn the pages.

3 Push the cursor stick (OK) to return to the original screen.

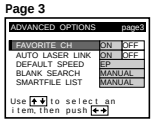
Page 1


ADVANCED OPTIONS page1
AUTO ANT SEL ON OFF
AUTO STEREO ON OFF
AUDIO MIX ON OFF
TUNER AUDIO MAIN SAP
SHARPNESS L – H
Use ↕ to select an item, then push ↔

Page 2


ADVANCED OPTIONS page2
APC ON OFF
DIMMER ON OFF
AUTO TAPE SPEED ON OFF
TAPE SELECT AUTO 180
SMART CUE MEDIUM
Use ↕ to select an item, then push ↔

Page 3


ADVANCED OPTIONS page3
FAVORITE CH ON OFF
AUTO LASER LINK ON OFF
DEFAULT SPEED EP
BLANK SEARCH MANUAL
SMARTFILE LIST MANUAL
Use ↕ to select an item, then push ↔

Menu choices

Initial settings are indicated in bold print.

Menu option	Set this option to
AUTO ANT SEL	• **ON** if your TV is connected only to VHF/UHF OUT on the VCR. To play a tape, set the TV to the VCR channel (channel 3 or 4). • OFF if your TV is connected to both VHF/UHF OUT and LINE OUT on the VCR. To play a tape, set the TV to the VCR input.
AUTO STEREO	• **ON** to receive stereo programs. • OFF to reduce noise. The sound changes to monaural.
AUDIO MIX	• ON to listen to the sound recorded on hi-fi and normal audio tracks at the same time. The AUDIO MONITOR button will not function. • **OFF** to listen to hi-fi and normal audio tracks separately. Select the sound using the AUDIO MONITOR button.

Changing menu options (continued)

Menu option	Set this option to
BLANK SEARCH	• **MANUAL** to display a screen asking whether to search for the Blank Time when the timer is set. • AUTO to set the VCR to perform the Blank Time search automatically each time the timer is set. • OFF to switch off the Blank Time search function. For details, see page 51.
SMARTFILE LIST	• **MANUAL** to display the SmartFile search list only when you press the SMARTFILE button. • AUTO to display the SmartFile search list automatically when you insert a SmartFile tape.

Note

• If you set the DEFAULT SPEED option to EP, you can still change the recording tape speed to SP, or vice versa by pressing the SP/EP button only for that program. Next time you record a program, the recording tape speed is automatically set to the position you set in the DEFAULT SPEED option.

Menu option	Set this option to
TUNER AUDIO	• **MAIN** to record the main sound on both hi-fi and normal audio tracks. • SAP to record the SAP (Second Audio Program) sound on both hi-fi and normal audio tracks.
SHARPNESS	L (Low) through H (High) to adjust the sharpness of the picture. L to turn off the sharpness control.
APC	• **ON** to switch on the APC (Adaptive Picture Control) function and improve picture quality. • OFF to switch off APC.
DIMMER	• ON to make the display window dim. • **OFF** to make it brighter.
AUTO TAPE SPEED	• **ON** to change the timer recording tape speed automatically to the EP mode when the remaining tape length becomes shorter than the recording time. To operate AUTO TAPE SPEED, set TAPE SELECT correctly. • OFF to keep the tape speed.
TAPE SELECT	• **AUTO** when using a T-160 length tape or any tape shorter than a T-140 length tape. • 180 when using a T-140 or T-180 length tape. For details, see page 8.
SMART CUE	• **MEDIUM** to set the automatic rewinding time on skip playback to a medium length. • SHORT to set to a short length. • LONG to set to a long length.
FAVORITE CH	• **ON** when using favorite channel list. • OFF when using station ID list. For details, see pages 10 and 22.
AUTO LASER LINK	• **ON** to switch the video input automatically to "L3" and display the camcoder picture on the TV screen when the camcorder is aimed at the LASER LINK IR receiver of the VCR. • OFF to not switch the video input automatically. For details, see page 35.
DEFAULT SPEED	• **EP** to set the recording tape speed automatically back to EP after recording. • SP to set the recording tape speed automatically back to SP after recording. • FLOAT to set the recording tape speed to the last position selected from the SP/EP button.

continued

Watching the camcorder picture without connecting cables — LASER LINK

This VCR has a built-in AV cordless IR receiver which lets you watch the picture of a LASER LINK* compatible camcorder on your TV without connecting cables. LASER LINK is a system which transmits and receives pictures and sound between LASER LINK compatible video equipment by using infrared rays.

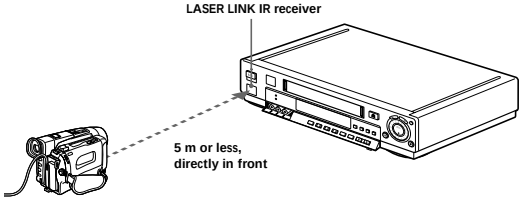
Before you start...

• Turn on your TV and set it to the video channel.

1 Press I/⏻ POWER to turn on this VCR.

2 Adjust the angle and direction of the LASER LINK IR emitter of the camcorder to match the LASER LINK IR receiver of this VCR.

Place the camcorder directly in front of this VCR within the range specified below.



* LASER LINK is a trademark of Sony Corporation.

continued

Watching the camcorder picture without connecting cables — LASER LINK (continued)

3 Start camcorder playback using LASER LINK.

The VCR input automatically switches to "L3" and the camcorder picture appears on the TV screen.

Refer to the operating instructions of the camcorder for camcorder operations using LASER LINK.

4 Adjust the distance and angle between the camcorder and the VCR so that the playback picture appears clearly on the TV.

To stop watching the camcorder picture

Move the camcorder so that its LASER LINK IR emitter no longer points at the LASER LINK IR receiver of this VCR. The video channel or input returns to the position selected before using LASER LINK.

Tips

- Cable connection is recommended when recording or editing the picture from the camcorder (page 38).
- If you do not want to automatically switch the video input and display the picture on the TV when the camcorder is aimed at the IR receiver of the VCR, set AUTO LASER LINK to OFF in the ADVANCED OPTIONS menu. In this case, you can view the picture by pressing the INPUT SELECT button to switch the input to "L3" (see page 33).

Notes

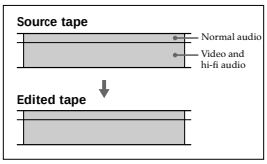
- Do not cover the IR emitter of the camcorder or the IR receiver of the VCR with your hands or other objects.
- Infrared rays cannot pass through walls or opaque glass. Be sure to place the VCR in an unobstructed position. Using LASER LINK through glass will shorten the transmission range.
- Do not place the camcorder too close to the VCR, as this may cause noise and/or beat.
- When connecting the VCR to the TV using only the antenna cable, press the TV/VIDEO button to display the VIDEO indicator in the VCR's display window before starting to use LASER LINK.
- The IFT-AV1 Cordless AV Transmitter System uses a different frequency band, so it cannot be used with this VCR.

Editing methods

This section introduces you to various ways to edit tape recordings.

Basic editing

You can make a copy of a tape.



Insert editing

You can replace an existing scene with material from another recording. There are three kinds of insert editing.

Video insert

Replaces the original video and hi-fi audio. The monaural sound on the normal audio track is retained.

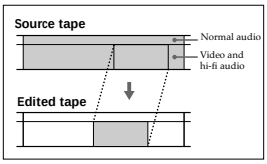
Audio insert

Replaces the original monaural sound on the normal audio track. The video and hi-fi sound are left intact. For example, you can use this feature to add commentary to a tape recorded on a camcorder.

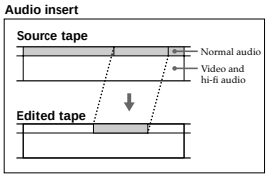
A/V insert

Replaces the original video and both hi-fi and monaural sound.

Video insert

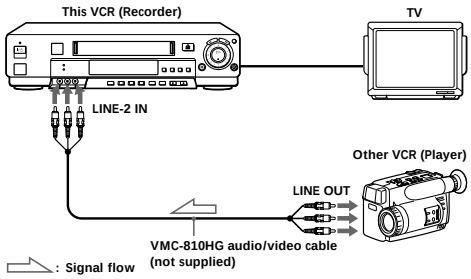


Audio insert



Hooking up to a VCR or stereo system

How to hook up to record on this VCR



How to hook up to a stereo system

Connect LINE-2 IN AUDIO on this VCR to the audio output jacks on the stereo system, using the RK-C510KS audio cable (not supplied).

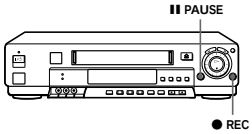
If the other VCR has a CONTROL S OUT jack for synchronized editing

Hook up to record on the other VCR, then connect the VCRs via the CONTROL S jacks. The CONTROL S connection lets you control (pause and release pause) both VCRs from the recording VCR.

Notes

- Make sure you connect the plugs to jacks of the same color.
- If the other VCR is a monaural type and connected to this VCR's LINE-2 IN jacks, connect the audio plug to the AUDIO L (white) jack. The sound is recorded on both right and left channels. When connecting to the AUDIO R (red) jack, the sound is recorded only on the right channel.
- If you connected this VCR to both the LINE IN and LINE OUT jacks of the other VCR, select the input correctly to prevent a humming noise.
- You can also use the LINE-1 IN jacks for editing. If the other VCR is a monaural type, the sound is recorded only on the channel whose jack is connected to the audio plug. To record on both right and left channels, connect the audio plugs to the AUDIO R/L jacks using a VMC-910HG audio/video cable (not supplied).
- If the CONTROL S IN jack is used for S-Link™ (A/V bus control) with a TV, the CONTROL S connection cannot be used for editing.

Basic editing
(when recording on this VCR)



Before you start editing

- Turn on your TV and set it to the video channel.
- Press INPUT SELECT to display "L2" (or "L1") in the display window.
- Press SP/EP to select the tape speed, SP or EP.
- On this VCR, press EDIT to display "EDIT" in the display window. If the other VCR has a similar button, press it to activate edit function.

1 Insert a source tape with its safety tab removed into the other (playback) VCR. Search for the point to start playback and set it to playback pause.

2 Insert a tape into this (recording) VCR. Search for the point to start recording and press ❚❚ PAUSE.

3 Press ● REC on this VCR and set it to recording pause.

4 To start editing, press the ❚❚ PAUSE buttons on both VCRs at the same time.

To stop editing

Press the ■ STOP buttons on both VCRs.

Tip

- To cut out unwanted scenes while editing, press ❚❚ PAUSE on this VCR when an unwanted scene begins. When it ends, press ❚❚ PAUSE again to resume recording.

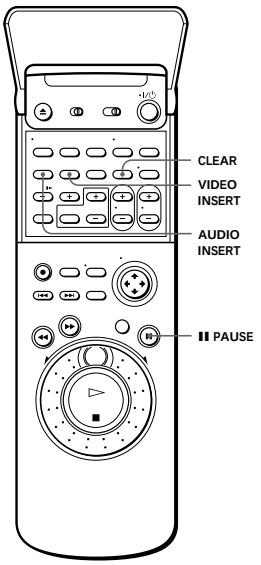
Note

- If you start recording following the procedure above, the VCR won't start recording with the APC function. To record a tape with the APC function, press ● REC again during recording pause in step 3 so that the VCR analyzes the tape. Then when you start recording in step 4, press ❚❚ PAUSE immediately after the APC indicator stops flashing. If you press ❚❚ PAUSE before the APC indicator stops flashing, the APC function is canceled.

Insert editing

Before you start editing

- Turn on your TV and set it to the video channel.
- Press INPUT SELECT to display "L2" in the display window.
- Press SP/EP to select the tape speed, SP or EP.
- On this VCR, press EDIT to display "EDIT" in the display window. If the other VCR has a similar switch, set it to ON as well.



1 Insert a source tape into the playback VCR or the stereo system. Search for the point to start playback and set it to playback pause.

2 Insert a prerecorded tape into this (recording) VCR. Search for the end of the scene to be replaced and press ❚❚ PAUSE.

3 Press CLEAR on this VCR to reset the counter to "0:00:00".

4 Rewind the prerecorded tape to the beginning of the scene to be replaced.

The VCR pauses.

5 Press the INSERT buttons:

To replace	Press
Picture and hi-fi sound	VIDEO INSERT. "VID INS ❚❚" appears on the TV screen and "VINSER T" appears in the display window.
Monaural sound only	AUDIO INSERT. "AUD INS ❚❚" appears on the TV screen and "AINSER T" appears in the display window.
Picture, hi-fi and monaural sound	AUDIO INSERT, then VIDEO INSERT. "A/V INS ❚❚" appears on the TV screen and "AVINSER T" appears in the display window.

To cancel the video or audio insert function, press VIDEO INSERT or AUDIO INSERT again.

6 To start editing, press the ❚❚ PAUSE buttons on this VCR and the other VCR (or stereo system) at the same time.

To stop editing

Press the ■ STOP buttons on this VCR and the other VCR (or stereo system).

To listen to both the hi-fi and normal audio

Set AUDIO MIX to ON in the ADVANCED OPTIONS menu (page 32). Use this feature to listen to inserted audio together with the original hi-fi audio. When AUDIO MIX is set to ON, the AUDIO MONITOR button does not function. Remember to reset AUDIO MIX to OFF after playing the tape.

Note

- To use the INSERT function, this VCR must be set to playback pause, not recording pause.

About the SmartFile function

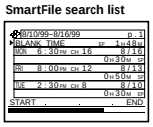
SmartFile* allows you to view the contents of your video tape (recording date, channel, etc.) on the TV screen. It is no longer necessary to rewind, fast-forward, or play back a tape to find out what is recorded. You can also locate and start playback of a specific program, or find the position from which you want to start recording by using this list. Program data is stored in the memory of the SmartFile label attached to the tape.

The following functions are possible using SmartFile:

Recording using the SmartFile function (page 44)

To use the SmartFile function, attach the SmartFile label to the tape. If you record a program on a tape with a SmartFile label, the contents will appear on the SmartFile search list. With the SmartFile list, you can also easily find the beginning of the available recording space.

SmartFile search list

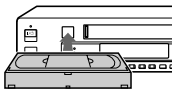


Selecting and playing a program (page 53)

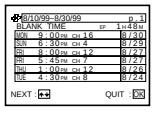
To play back a recorded program, select the program you want to watch using the SmartFile search list. The VCR locates the program and playback starts automatically.

Checking the contents of a tape (page 55)

When you bring the SmartFile label close to the SMARTFILE sensor on the VCR, a summary of the recorded programs appears in the SmartFile check list. It is not necessary to insert the tape into the VCR and press ▷ PLAY to find out what is recorded on it. This feature allows you to easily find the program you want to watch, or to quickly find a tape with enough recording space.



SmartFile check list



* SmartFile is a trademark of Sony Corporation.

Labeling a recorded program and tape (page 56)

You can attach an electronic "label" to the video tape and it's programs on the SmartFile list. Labeling the recorded programs enables you to find a program easily when you want to play it back. Also, once you label a program which you set to record regularly (i.e. everyday, same day of a week, etc.), the VCR recognizes the label and will automatically label all future recordings of the same program.

Protecting a recorded program (page 61)

You can protect a recorded program from accidental over-recording or erasure.

Erasing the data of an unwanted program (page 63)

By erasing a program from the SmartFile list, the VCR will record over the unwanted program.

Registering the contents of a recorded tape in the SmartFile label (page 65)

You can register programs recorded on a tape in the memory of a new SmartFile label.

Storing program data from the DIRECTV digital satellite receiver (Program Data Download) (page 67)

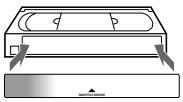
If you connect a DIRECTV digital satellite receiver equipped with the Program Data Download function, you can store the program and category name transmitted from the DIRECTV digital satellite receiver on a SmartFile tape. The DIRECTV digital satellite receiver equipped with the Program Data Download function will be available in the future.

Recording using the SmartFile function

To use the SmartFile function, attach the SmartFile label to the spine of the cassette tape. If you record a program on a tape with a SmartFile label, program data, such as the date and channel, is automatically stored in the memory of the SmartFile label.

Attaching the SmartFile label to the cassette tape

To use the SmartFile function, attach the supplied SmartFile label to the cassette tape. Remove any stains or dirt from the surface of the spine of the tape. Then, holding both edges of the SmartFile label so that it doesn't bend, attach it along the guide line to the spine of the cassette tape. This tape is henceforth referred to as a SmartFile tape.



Note on the purchase of SmartFile labels

- **For the customers in the USA**
  To order additional SmartFile labels, see the back page.
- **For the customers in Canada**
  Additional SmartFile labels can be purchased at Sony of Canada Ltd. Authorized VHS Dealers.

Notes

- The SmartFile label is equipped with a memory chip. The memory chip may be damaged and cannot be used when you:
  – twist or fold the SmartFile label.
  – remove the SmartFile label and re-attach it to a tape.
  – attach more than one SmartFile label to a tape.
  – attach some metal, or sticker which has metal, to the SmartFile label.
  – write too strongly on the SmartFile label using a ballpoint pen or similar sharp instrument.
  – disassemble or remodel a label.
- Do not leave the SmartFile label in a place subject to excessive dust or dirt, direct sunlight, humidity, mildew, strong magnetism, or near heat sources.
- If you attach the SmartFile label to a short length tape, such as T-30 or shorter, you cannot use the SmartFile function.

Recording a program on the SmartFile tape

When recording a program on the SmartFile tape, no matter what method you use to record the program (normal recording, the VCR Plus+ GOLD system recording, etc.), program data (date, channel, recording start time, etc.) is stored in the memory of the SmartFile label. The SmartFile label can contain up to 12 programs' data. When the number of the stored programs goes over 12, the oldest program data is erased from the SmartFile list. However, a program which lasts less than about 15 minutes in EP mode or about 5 minutes in SP mode cannot be stored in the memory.
When you record a program on the SmartFile tape which already contains program data, see "Recording after locating the Blank Time space" on page47.

Tip

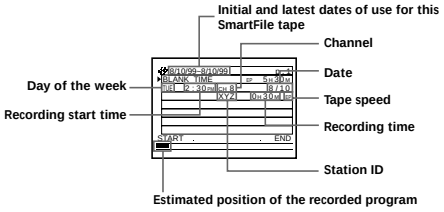
- You can protect a recorded program from accidental over-recording or erasure (see page 61).

Note

- If you press ❚❚ PAUSE one or more times during recording, thereby creating short lengths of recorded time between such pauses, program data may not be stored in the SmartFile label.

To check the information of a recorded program

Press SMARTFILE. The SmartFile search list appears. The recording day of the week, start time, channel, date, station ID, recording time, and tape speed appear on the list. The longest space which doesn't have any program data (Blank Time space) appears as "BLANK TIME".



continued

Tips

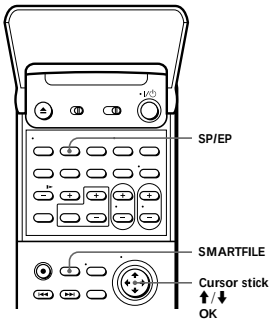
- The station ID appears on the TV screen only when you complete Smart Channel Mapping and the VCR receives the program information signal (see page 54 of the supplied hookup/setup manual).
- When the VCR receives the program information signal, the program name may appear in place of the day of the week, recording start time and channel.
- You can manually name a recorded program and select the category. You can also name the SmartFile tape (see page 56).

Notes

- If you don't set the clock or the clock isn't set to the correct time, the initial and latest dates of use for the SmartFile, the recording date and day of the week, and the recording start time won't be stored correctly on the SmartFile list.
- When you record a program using the normal recording mode while CABLE MOUSE is set to ON in the CABLE BOX CONTROL menu, the channel number is stored as "CH– – –".
- When you set AUTO TAPE SPEED to ON in the ADVANCED OPTIONS menu, and the tape speed automatically changes from SP to EP during recording, the VCR displays the entire recording time converted in SP mode to the SmartFile list.
- The recording time length in the SmartFile list is an estimation and may be slightly different from the actual recorded time length.

Recording after locating the Blank Time space

The SmartFile function identifies not only the largest amount of available blank space, but also recorded material that doesn't have corresponding program data stored in the SmartFile label. The longest available recording space (including programs that are not stored on the SmartFile label) is referred to as "Blank Time space". You can locate the beginning of the Blank Time space for recording. If there is a recorded program after the Blank Time space, the VCR will record over that program unless you stop recording. If there is a program you want to prevent from being recorded over or erased, protect that program before you start recording another program (see page 61).

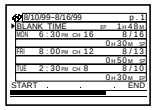


Before you start…

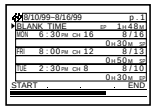
- Turn on your TV and set it to the video channel.

1 Insert a SmartFile tape with its safety tab in place.
The VCR turns on and the SMARTFILE indicator lights up.

2 Press SMARTFILE.
The SmartFile search list appears on the TV screen. The Blank Time space appears in the "BLANK TIME" row.
The BLANK indicator lights up and the Blank Time space also appears in the display window.



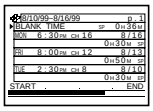
3 Move the cursor stick ↑/↓ to select BLANK TIME.
BLANK TIME is on page 1 of the SmartFile search list.



continued

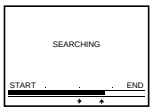
4 Press SP/EP to select the tape speed, SP or EP.

The BLANK TIME changes according to the selected tape speed. Select a tape speed that matches the length of the program you want to record.



5 Push the cursor stick (OK).

The VCR goes to the beginning of the Blank Time space and stops.

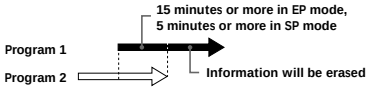


6 Start recording.

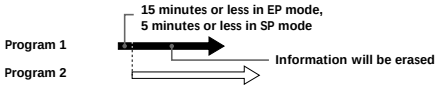
If the recordings overlap

If a newly recorded program overlaps a stored program, the data appearing in the SMARTFILE list is as follows.

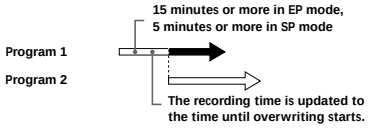
- If the second program overwrites the first program for 15 minutes or more in EP mode or 5minutes or mor e in SP mode from where the first program starts, the first program data is erased.



- If the remaining length of the first program is 15 minutes or less in EP mode or 5minutes or less in SP mode after being overwritten by the second program, the first program data is erased.



- If the second program starts recording 15 minutes or more in EP mode or 5minutes or more in SP mode after the first program starts, the data for both programs appears. In this case, the stored program's recording time is updated to the time when the second program starts.


15 minutes or more in EP mode,
5 minutes or more in SP mode
Program 1
Program 2
The recording time is updated to
the time until overwriting starts.

Tip

- If you set SMARTFILE LIST to AUTO in the ADVANCED OPTIONS menu, the SmartFile search list appears automatically when you insert a SmartFile tape (see page 34).

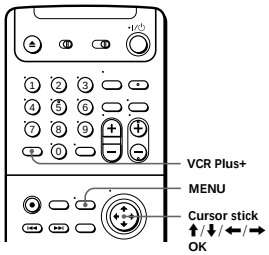
Note

- You may not be able to locate the beginning of the Blank Time space correctly in the above step 5 when:
  - the SmartFile tape contains one or more short length (less than about 15 minutes in EP mode and about 5 minutes in SP mode) programs that are not stored in the SmartFile label.
  - the SmartFile tape is damaged or dirty.

continued

Setting timer recording in the Blank Time space

If you set the timer to record programs while a SmartFile tape is inserted, the VCR searches for the Blank Time space. When the Blank Time space is located, the VCR goes to the beginning of the Blank Time space and stands by for recording. If there is a recorded program after the Blank Time space, the VCR will record over that program unless you stop recording. If there is a program you want to prevent from being recorded over or erased, protect that program before you start recording another program (see page 61).



Before you start…

- Turn on your TV and set it to the video channel.

1 Insert a SmartFile tape with its safety tab in place.

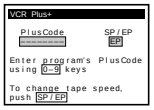
The VCR turns on and the SMARTFILE indicator lights up.

2 Set the timer.

- When using the VCR Plus+ GOLD system (for details, see page 12):

❶ Press VCR Plus+.

❷ Enter the PlusCode number.

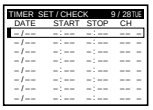


- When setting the timer manually (for details, see page 15):

❶ Press MENU, then move the cursor stick ↑/↓ to select TIMER SET/CHECK and push the cursor stick (OK).

❷ Set the date, start and stop times, channel number and tape speed.

❸ Move the cursor stick ➡ to confirm the setting and push the cursor stick (OK).



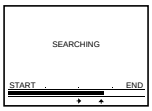
The AUTO BLANK SEARCH screen appears.

3 Move the cursor stick ⬅/➡ to select YES and push the cursor stick (OK).

The Blank Time search screen appears.

The VCR goes to the beginning of the Blank Time space and stops, then turns off automatically.

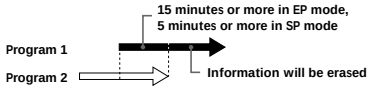
The ◴ indicator appears in the display window and the VCR stands by for recording. If you are using a cable box, leave it on.



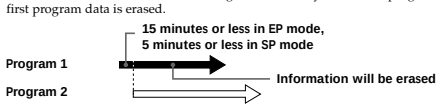
If the recordings overlap

If a newly recorded program overlaps a stored program, the data appearing in the SMARTFILE list is as follows.

- If the second program overwrites the first program for 15 minutes or more in EP mode or 5minutes or mor e in SP mode from where the first program starts, the first program data is erased.

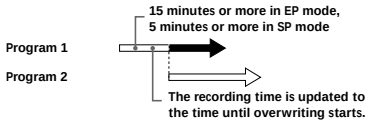


- If the remaining length of the first program is 15 minutes or less in EP mode or 5minutes or less in SP mode after being overwritten by the second program, the first program data is erased.



continued

- If the second program starts recording 15 minutes or more in EP mode or 5minutes or more in SP mode after the first program starts, the data for both programs appears. In this case, the stored program's recording time is updated to the time when the second program starts.


15 minutes or more in EP mode,
5 minutes or more in SP mode
Program 1
Program 2
The recording time is updated to
the time until overwriting starts.

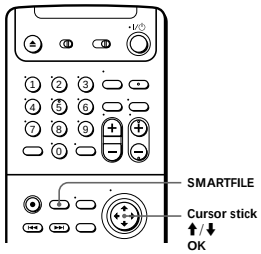
Tip

- You can set BLANK SEARCH in the ADVANCED OPTIONS menu so that Blank Time search is automatically performed each time the timer is set (AUTO). Select OFF to cancel this option (see page 34).

Note

- You may not be able to locate the beginning of the Blank Time space correctly in the above step 3 when:
  - the SmartFile tape contains one or more short length (less than about 15 minutes in EP mode and about 5 minutes in SP mode) programs that are not stored in the SmartFile label.
  - the SmartFile tape is damaged or dirty.

Selecting and playing a program



You can automatically locate and start playback of a program recorded on the SmartFile tape. Select a program in the SmartFile search list. The SmartFile search list can contain up to 12 programs.

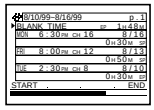
Before you start...

- Turn on your TV and set it to the video channel.

1 Insert a SmartFile tape.

The VCR turns on and the SMARTFILE indicator lights up.

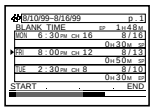
2 Press SMARTFILE.



The SmartFile search list appears on the TV screen.

The BLANK indicator lights up and the Blank Time space also appears in the display window.

3 Move the cursor stick ↑/↓ to select a program.



Moving the cursor stick ↑/↓ repeatedly will turn the pages.

4 Push the cursor stick (OK).

The VCR starts searching for the beginning of the selected program. Playback starts automatically from that point.

To stop searching

Press ■ STOP.

continued

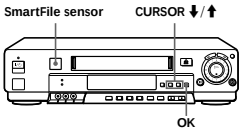
Tip

- If you set SMARTFILE LIST to AUTO in the ADVANCED OPTIONS menu, the SmartFile search list appears automatically when you insert a SmartFile tape (see page 34).

Note

- You may not be able to locate the beginning of the selected program correctly when:
  - the SmartFile tape contains one or more short length (less than about 15 minutes in EP mode and about 5 minutes in SP mode) programs that are not stored in the SmartFile label.
  - the SmartFile tape is damaged or dirty.

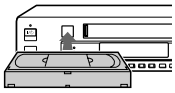
Checking the contents of a tape



You can display the program data list of a SmartFile tape on the TV screen. It is not necessary to insert the tape into the VCR. This feature allows you to quickly find a specific program or to find a tape with enough recording space.
The SmartFile check list can contain up to 12 programs.

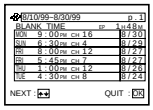
Before you start...

- Turn on your TV and set it to the video channel.



1 Hold the label side of the SmartFile tape close to the SmartFile sensor.

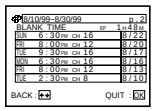
Slowly bring the center of the label within 3 cm of the SmartFile sensor.


8/10/99–8/30/99 p. 1
BLANK TIME SP 1H48M
MON 9:00PM CH 16 8/20
SUN 6:30PM CH 4 8/29
SU 8:00PM CH 12 8/27
FRI 5:45PM CH 7 8/27
WED 1:00PM CH 12 8/26
TUE 4:30PM CH 8 8/24
NEXT : QUIT : OK

There is a short beep, the SMARTFILE indicator lights up, and the SmartFile check list appears.

The BLANK indicator lights up and the Blank Time space also appears in the display window.

2 Press CURSOR ↓/↑ repeatedly to turn the pages.


8/10/99–8/30/99 p. 2
BLANK TIME SP 1H48M
SUN 6:30PM CH 16 8/22
SU 8:00PM CH 12 8/20
TUE 9:30PM CH 16 8/17
MON 6:30PM CH 16 8/16
SU 8:00PM CH 12 8/13
TUE 2:30PM CH 8 8/10
BACK : QUIT : OK

3 Press OK on the VCR to exit the menu.

Tips

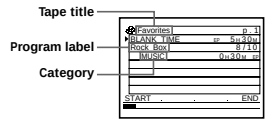
- The SmartFile check list automatically disappears after about 3 minutes of nonuse.
- If you press SP/EP while the SmartFile check list is displayed, the BLANK TIME remaining tape display changes.
- You can also use the cursor stick ↑/↓ and OK on the remote commander.
- If you press a button other than SP/EP or the cursor stick (OK), the SmartFile check list disappears.

Notes

- You cannot display the SmartFile check list while:
  - you display the SmartFile list of a different SmartFile tape inserted into the VCR.
  - you display any other menu.
  - you play back the tape at any speed other than normal.
  - you view the camcorder picture using LASER LINK.
- If the SmartFile check list doesn't appear on the TV screen, try again by drawing the SmartFile tape away from the SmartFile sensor at least 5 cm, then bring it back to within 3 cm of the sensor.

Labeling a recorded program and tape

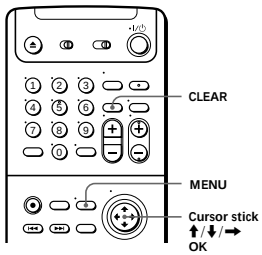
You can electronically "label" a program and select a category, such as SPECIAL or MOVIE, for a recorded program in the SmartFile list. You can also label a tape. Up to 18 characters can be input for a program and tape label.



Labeling a recorded program and selecting a category

Before you start...

- Turn on your TV and set it to the video channel.

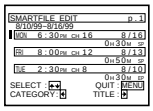


1 Insert a SmartFile tape.

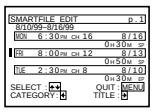
The VCR turns on and the SMARTFILE indicator lights up.

2 Press MENU, then move the cursor stick ↑/↓ to select SMARTFILE EDIT and push the cursor stick (OK).

The SMARTFILE EDIT menu appears.

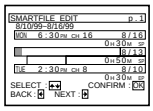


3 Move the cursor stick ↑/↓ to select a program.



4 Move the cursor stick →.

The cursor moves to the program label input position.



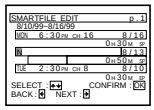
5 Label the program.

❶ Move the cursor stick ↑/↓ to select a character.

Each time you move the cursor stick ↓, the character changes as shown below.

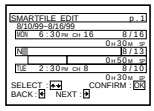
A → B → ... → Z → symbol → 0 → 1 → ... 9 → a → b → ... → z → (blank space)

If you make a mistake, press CLEAR.



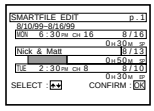
❷ To set the next character, move the cursor stick →.

The cursor moves to the next position.



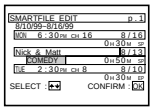
❸ Repeat steps ❶ and ❷ to label the program.

6 Push the cursor stick (OK).



continued

7 Move the cursor stick ↑/↓ to select a category.



Each time you move the cursor stick ↓, the category changes as shown below.

SPECIAL → MOVIE → NEWS → SHOW → SPORTS → KIDS → MUSIC → ARTS → SERIES → EDUCATI (education) → HOBBY → SHOPPIN (shopping) → VARIETY → COMEDY → DRAMA → DAYTIME → HOW TO → OTHERS → (blank)

8 Push the cursor stick (OK).

The program label and a selected category are stored.

9 Press MENU to exit the menu.

To erase the program label

Press CLEAR after step 3 above. The program label is erased and the recording start time and channel number reappear.

To erase the selected category

Press CLEAR in step 7 above. The selected category is erased and the space becomes blank.

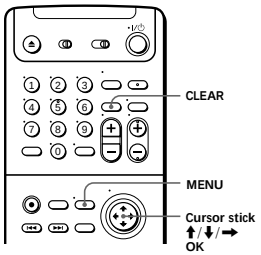
To label a regularly scheduled timer-recorded program

Once you label a program which is set to record regularly (i.e. everyday, same day of the week, etc.) in the VCR Plus+ GOLD system or timer recording mode, the VCR recognizes the label and will automatically label all future recordings of the same program. The set label is assigned even when an information signal containing the program name, category name or other information is broadcast with the program. However, if you change the program label and category several times, the VCR may automatically label only the last program of which the program label and category are changed.

Labeling a tape

Before you start...

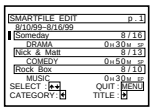
- Turn on your TV and set it to the video channel.



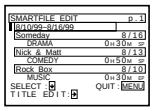
1 Insert a SmartFile tape.

2 Press MENU, then move the cursor stick ↑/↓ to select SMARTFILE EDIT and push the cursor stick (OK).

The SMARTFILE EDIT menu appears.

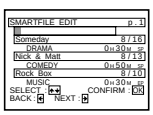


3 Move the cursor stick ↑ to select the tape title.



4 Move the cursor stick →.

The cursor moves to the tape title input position.



continued

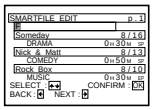
5 Label the tape.

❶ Move the cursor stick ↑/↓ to select a character.

Each time you move the cursor stick ↓, the character changes as shown below.

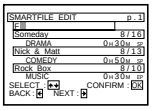
A → B → ... → Z → symbol → 0 → 1 → ... 9 → a → b → ... → z → (blank space)

If you make a mistake, press CLEAR.



❷ To set the next character, move the cursor stick ➡.

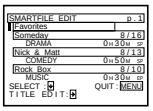
The cursor moves to the next position.



❸ Repeat steps ❶ and ❷ to label the tape.

6 Push the cursor stick (OK).

The tape title is stored.

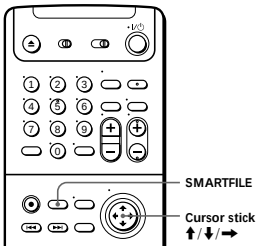


7 Press MENU to exit the menu.

To erase the tape title

Press CLEAR after step 3 above. The tape title is erased and the recording date reappears. When you want to erase the recording date from the tape title column, press CLEAR again.

Protecting a recorded program



You can protect a recorded program using the SmartFile function from accidental over-recording or erasure. When you start recording from a position prior to the protected program, the recording stops automatically before the protected program.

Before you start...

- Turn on your TV and set it to the video channel.

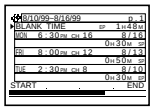
1 Insert a SmartFile tape.

The VCR turns on and the SMARTFILE indicator lights up.

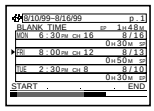
2 Press SMARTFILE.

The SmartFile search list appears on the TV screen.

The BLANK indicator lights up and the Blank Time space also appears in the display window.

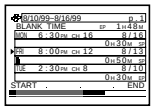


3 Move the cursor stick ↑/↓ to select the program you want to protect.



4 Move the cursor stick ➡.

The 🔒 indicator appears to the left of the selected program and the program becomes protected.



5 Press SMARTFILE.

The SmartFile search list disappears.

continued

To unlock the protected program

Move the cursor stick ⬅ in step 4 above. The 🔒 indicator disappears and you can record over this program.

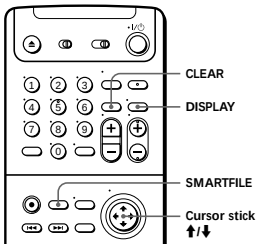
Tips

- When you start recording from a position prior to the protected program, the recording automatically stops no more than about 3 minutes in SP mode and about 8 minutes in EP mode before the beginning of the protected program.
- If you protect a program just after the Blank Time space, BLANK TIME becomes shortened by about 3 minutes in SP mode and about 8 minutes in EP mode.
- If you try to record on a SmartFile tape containing a protected program, a message indicating that there is a protected program on this tape appears on the TV screen.
- If you set SMARTFILE LIST to AUTO in the ADVANCED OPTIONS menu, the SmartFile search list appears automatically when you insert a SmartFile tape (see page34).

Notes

- When you record another program just after a protected program, locate the beginning of the Blank Time space by following the instructions in "Recording after locating the Blank Time space" on page 47. Otherwise, if the recording start point overlaps the protected program, the VCR may record over the protected program.
- If the VCR Plus+ GOLD system or timer recording program overlaps the protected program, the VCR automatically stops recording before the protected program and ejects the tape.
- If you insert a SmartFile tape which contains a protected program or protect a program for the first time on a new tape, the VCR will analyze the position of the protected program for a few seconds. You cannot operate the VCR while the VCR is analyzing the tape.
- If the SmartFile list contains 12 protected programs, the next program you record won't be stored in the SmartFile list.

Erasing the data of an unwanted program



You can erase an unwanted program from the SmartFile list. When you erase a program from the list, that portion of tape is subject to Blank Time space priority.

Before you start...

- Turn on your TV and set it to the video channel.

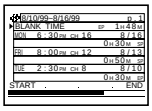
1 Insert a SmartFile tape.

The VCR turns on and the SMARTFILE indicator lights up.

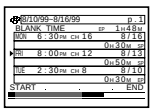
2 Press SMARTFILE.

The SmartFile search list appears on the TV screen.

The BLANK indicator lights up and the Blank Time space also appears in the display window.



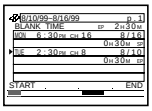
3 Move the cursor stick ↑/↓ to select a program you want to erase from the list.



4 Press CLEAR.

The selected program is erased from the SmartFile list.

If you erase a program by mistake, press DISPLAY to make the program reappear.



5 Press SMARTFILE.

The SmartFile search list disappears.

continued

Erasing the data of an unwanted program (continued)

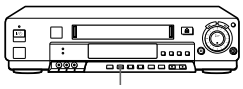
Tip

- If you set SMARTFILE LIST to AUTO in the ADVANCED OPTIONS menu, the SmartFile search list appears automatically when you insert a SmartFile tape (see page 34).

Notes

- You cannot erase a protected program from the SmartFile list. You have to first unlock the protected program by following the instructions in "To unlock the protected program" on page 62, then erase that program from the list.
- If a program is left about 15 minutes or less in EP mode, or about 5 minutes or less in SP mode, you cannot make the program reappear by using the DISPLAY button.

Registering the contents of a recorded tape in the SmartFile label



SMARTFILE GENERATOR

The VCR will register programs recorded on a tape in the memory of a new SmartFile label by detecting the index signals indicating the start of recorded programs. You can register up to the 12th program from the start of the tape. The programs appear from the bottom of the screen as Program No.1, Program No.2, ... Pr ogram No.12 in order from the start of the tape. The 13th and subsequent programs are ignored. You can manually name the registered program numbers and select the category (see page 56).

Before you start...

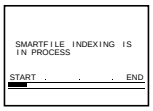
- Turn on your TV and set it to the video channel.

1 Attach a new SmartFile label to a recorded cassette tape.

2 Insert the SmartFile tape.

3 Press SMARTFILE GENERATOR.

A message appears indicating that the recorded programs are being registered. The index signals are detected from the start of the tape, and registration stops if the end of the tape is reached. The message disappears when registration is complete.



To stop registration to the SmartFile label

Press SMARTFILE GENERATOR.

The data registered before the button is pressed remains in the SmartFile label. You can register the programs again by pressing SMARTFILE GENERATOR.

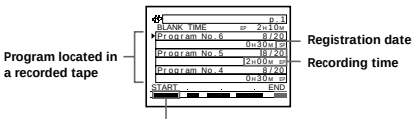
continued

Registering the contents of a recorded tape in the SmartFile label (continued)

To check the information of a registered program

Press SMARTFILE.

The SmartFile search list appears. The registered program number, registration date and recording time appear in this list. Note that the registration date differs from the recorded date.



Estimated position of the registered program

Tips

- The programs recorded on the tape can be registered again in a SmartFile label that already contains program data. However, the recorded date and time, program name and information input manually (such as the program label and category) are replaced with "Program No. XX".
- If the SmartFile label contains stored program data that includes protected programs, a message appears and registration stops.

Notes

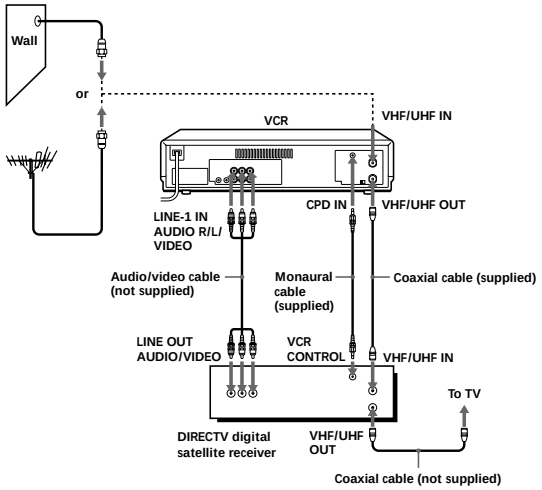
- Program data is not registered correctly in the SmartFile label when:
  - the program length is about 20 minutes or less in EP mode or about 7 minutes or less in SP mode.
  - the program does not have an index signal or the index signal has been recorded over and erased.
  - the tape is damaged or dirty.
- If you don't set the clock or the clock isn't set to the correct date, the registration date won't be stored correctly on the SmartFile list.
- After you press SMARTFILE GENERATOR and start registration, registration is interrupted if you press ■ STOP, ▷ PLAY, ▶▶ FF, ◀◀ REW, I/⏻ or I◀◀/▶▶I INDEX SEARCH. In these cases as well, the data registered up to the point when registration was interrupted remains in the SmartFile label.
- Tape speed may not be registered correctly when:
  - you set AUTO TAPE SPEED to ON in the ADVANCED OPTIONS menu, and the tape speed automatically changes from SP to EP during recording.
  - you use tapes recorded in the LP mode on other VCRs.

Storing program data from the DIRECTV digital satellite receiver (Program Data Download)

If you connect a DIRECTV digital satellite receiver equipped with the Program Data Download function and use the timer recording of the DIRECTV digital satellite receiver, the program and category name transmitted from the DIRECTV digital satellite receiver are stored on the SmartFile tape. The DIRECTV digital satellite receiver equipped with the Program Data Download function will be available in the future.

How to hook up to the DIRECTV digital satellite receiver

You should connect CPD IN of the VCR and VCR CONTROL of the DIRECTV digital satellite receiver using the supplied monaural cable.



continued

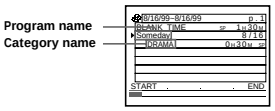
Storing program data from the DIRECTV digital satellite receiver (Program Data Download) (continued)

Setting up the DIRECTV digital satellite receiver

You have to set the VCR brand number on the DIRECTV digital satellite receiver. For example, select "99" in the VCR CONTROL menu to use a Sony VCR with the SmartFile function. For details, refer to the instruction manual of your DIRECTV digital satellite receiver.

Storing program data on the SmartFile tape

When you record a DIRECTV digital satellite program using the DIRECTV digital satellite receiver's timer, the program and category name are automatically stored on the SmartFile tape.



Notes

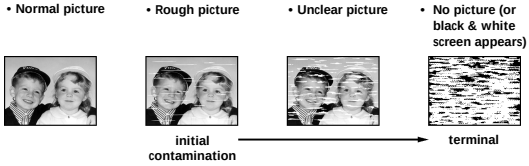
- Do not operate the VCR, the DIRECTV digital satellite receiver, and any other equipment connected to these units for at least 2 minutes after timer recording starts. If you operate these equipment immediately after timer recording starts, the correct program data may not be sent from the DIRECTV digital satellite receiver.
- When you use the VCR's timer for recording, program data from the DIRECTV digital satellite receiver is not stored on the SmartFile tape.

Troubleshooting

If you have any questions or problems not covered below, please consult your nearest Sony dealer.

	Symptom	Remedy
Power	The I/⏻ switch does not function.	• Connect the AC power cord securely. • Make sure the VCR is not locked. To unlock, hold down I/⏻ POWER on the VCR until the 🔑 indicator disappears.
	The power is turned on but the VCR does not operate.	• Moisture condensation occurs. Turn the power off, unplug the AC power cord and leave the VCR to dry for over three hours.
Clock	The clock has stopped and "–:– –" lights in the display window.	• The clock stops if the VCR is disconnected from the wall outlet for more than one hour. Reset the clock (and timer).
Playback	The playback picture does not appear on the TV screen.	• Make sure the TV is set to the channel for the VCR. If you are using a monitor, set it to video input.
	The picture is not clear.	• Adjust the tracking with the TRACKING +/– buttons. • The video heads are dirty (see below). Clean the video heads using the Sony T-25CLD, T-25CLDR, or T-25CLW video head cleaning cassette. If these cleaning cassettes are not available in your area, have the heads cleaned at your nearest Sony service facility (a standard service fee will be charged). Do not use a commercially available liquid type cleaning cassette other than Sony's, as it may damage the video heads. • The video heads may have to be replaced. Consult your local Sony dealer for more information.
	The picture rolls vertically during picture search.	• Adjust the vertical hold control on the TV or monitor.
	The picture has no sound.	• The tape is defective. • If you made A/V connections, check the audio cable connection.

Symptoms caused by contaminated video heads



continued

Troubleshooting (continued)

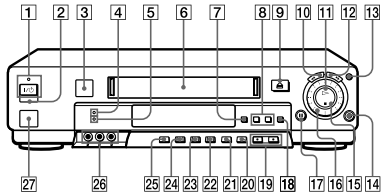
	Symptom	Remedy
Recording	A TV program does not appear on the TV screen.	• Make sure the TV is set to the channel for the VCR. If you are using a monitor, set it to video input. • Select the correct source with the INPUT SELECT button. Select a channel number when recording TV programs; select "L1" or "L2" when recording from other equipment.
	TV reception is poor.	• Adjust the TV antenna.
	The tape starts playing as soon as it is inserted.	• The safety tab has been removed. To record on this tape, cover the tab hole.
	The tape is ejected when you press ● REC.	• Check that the safety tab has not been removed.
	Nothing happens when you press ● REC.	• Make sure the tape is not at its end. • The current position of the tape is record protected. Search for the recording available space.
	Recording stops halfway.	• If the tape contains a protected program, recording automatically stops before the protected program. Use another tape which has enough recording space.
Timer recording	The timer does not operate.	• Check that the clock is set. • Make sure a tape has been inserted. • Check that the safety tab has not been removed. • Make sure the tape is not at its end. • The recording start point overlaps the protected program. • Make sure a program has been set for timer recording. • Make sure your timer settings have not already passed the current time. • Check that the cable box is turned on. • The clock stops if the VCR is disconnected from the wall outlet for more than one hour. Reset the clock and timer. • When you use cable box control, make sure the CABLE BOX CONTROL option is set to ON.

	Symptom	Remedy
Others	A tape cannot be inserted.	• Check that a tape isn't already in the tape compartment.
	The remote commander does not function.	• Make sure you are pointing the remote commander at the remote sensor on the VCR. • Replace all the batteries in the remote commander with new ones if they are weak. • Make sure the TV/VIDEO switch is set correctly. • If you are not using S-Link™, make sure that both miniplugs are unconnected. • The command mode of the remote commander is different from the one of the VCR.
	The channels on the VCR cannot be changed.	• Make sure the CABLE BOX CONTROL option is set to OFF.
	The tracking meter does not appear on the screen.	• The recording condition of the tape is very poor and tracking cannot be adjusted.
	You cannot control other TVs.	• Set your TV's code number. The code number may change when you replace the batteries of the remote commander.
	The SMARTFILE screen appears when a tape is not inserted.	• Press ■ STOP to close the SMARTFILE demonstration screen.
	The VCR needs to be cleaned.	• Clean the cabinet, panel and controls with a dry, soft cloth, or a soft cloth slightly moistened with a mild detergent solution. Do not use any type of solvent, such as alcohol or benzine.

Index to parts and controls

Refer to the pages indicated in parentheses ( ) for details.

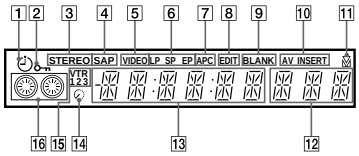
Front panel



1 I/⏻ POWER switch/indicator (13)
2 Remote sensor
3 SmartFile sensor (42, 55)
4 SMARTFILE indicator (47, 55)
5 REALITY REGENERATOR indicator (30)
6 Tape compartment
7 SMARTFILE button (45, 53, 61)
8 CURSOR ↓/↑ buttons (55)
9 ⏏ EJECT button (5)
10 ◀◀ REW (rewind) button (5, 19)
11 ▷ PLAY button (4, 20)
12 ▶▶ FF (fast-forward) button (5, 19)
13 JOG button (21)
14 ● REC (record) button (7, 24, 39)
15 ■ STOP button (5, 39)
16 Shuttle ring (8, 20)
17 ❚❚ PAUSE button (5, 39)
18 OK button (15, 48, 55)
19 CHANNEL/TRACKING +/– buttons (7, 30)
20 EDIT button (39)
21 REALITY REGENERATOR button (30)
22 EASY SET UP button
23 COMMAND MODE button
24 SMARTFILE GENERATOR button (65)
25 INPUT SELECT button (7, 9, 39)
26 LINE-2 IN VIDEO/AUDIO L/R jacks (38)
27 LASER LINK IR receiver (35)

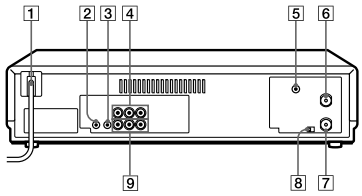
continued

Display window



1 Timer indicator (13, 17)
2 Child Lock indicator (14)
3 STEREO indicator (27)
4 SAP (Second Audio Program) indicator (27)
5 VIDEO indicator (8)
6 Tape speed indicator (7)
7 APC (Adaptive Picture Control) indicator (31)
8 EDIT indicator (39)
9 BLANK indicator (47)
10 AV INSERT indicator (41)
11 Tracking indicator (30)
12 Line/channel indicator (7, 39)
13 Time counter/clock indicator (5)
14 Remaining time indicator (8)
15 COMMAND MODE indicator
16 Tape/recording indicator (7)

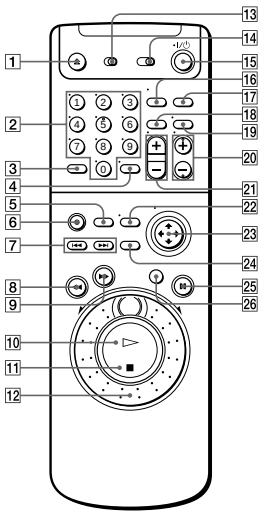
Rear panel



1 AC power cord
2 S-LINK (CONTROL S IN) jack (38)
3 CABLE BOX CONTROL (CONTROL S OUT) jack
4 LINE-1 IN AUDIO R/L/VIDEO jacks (38, 67)
5 CPD (Control and Program Data) IN jack (67)
6 VHF/UHF IN connector (67)
7 VHF/UHF OUT connector (67)
8 RF (Radio Frequency) UNIT switch
9 LINE OUT AUDIO R/L/VIDEO jacks

continued

Remote commander

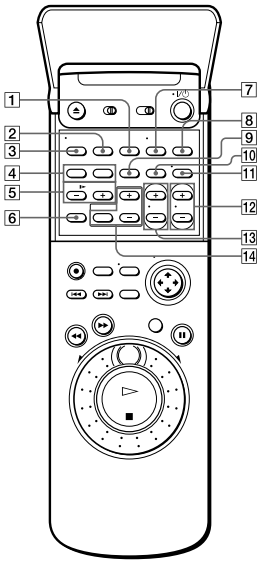


1 ⏏ EJECT button (5)
2 Number buttons (13)
3 VCR Plus+ button (12)
4 ENTER button (10, 13, 22)
5 SMARTFILE button (45, 53, 61)
6 ● REC (record) button (7, 24)
7 I◀◀ / ▶▶I INDEX SEARCH buttons (29)
8 ◀◀ REW (rewind) button (5, 19)
9 ▶▶ FF (fast-forward) button (5, 19)
10 ▷ PLAY button (4, 20)
11 ■ STOP button (5)
12 Shuttle ring (8, 20)

13 TV/VIDEO switch
14 COMMAND MODE switch
15 I/⏻ (power) switch (13)
16 TV/VIDEO button (8)
17 INPUT SELECT button (7, 9, 39)
18 CLEAR button (5, 13, 25, 57)
19 DISPLAY button (8)
20 CH (channel) +/– buttons (7)
21 VOL (volume) +/– buttons
22 MENU button (15, 25)
23 Cursor stick (15, 25, 47)
↑/↓/←/→
OK
24 SMART CUE button (5)
25 ❚❚ PAUSE button (5)
26 JOG button (21)

continued

Index to parts and controls (continued)

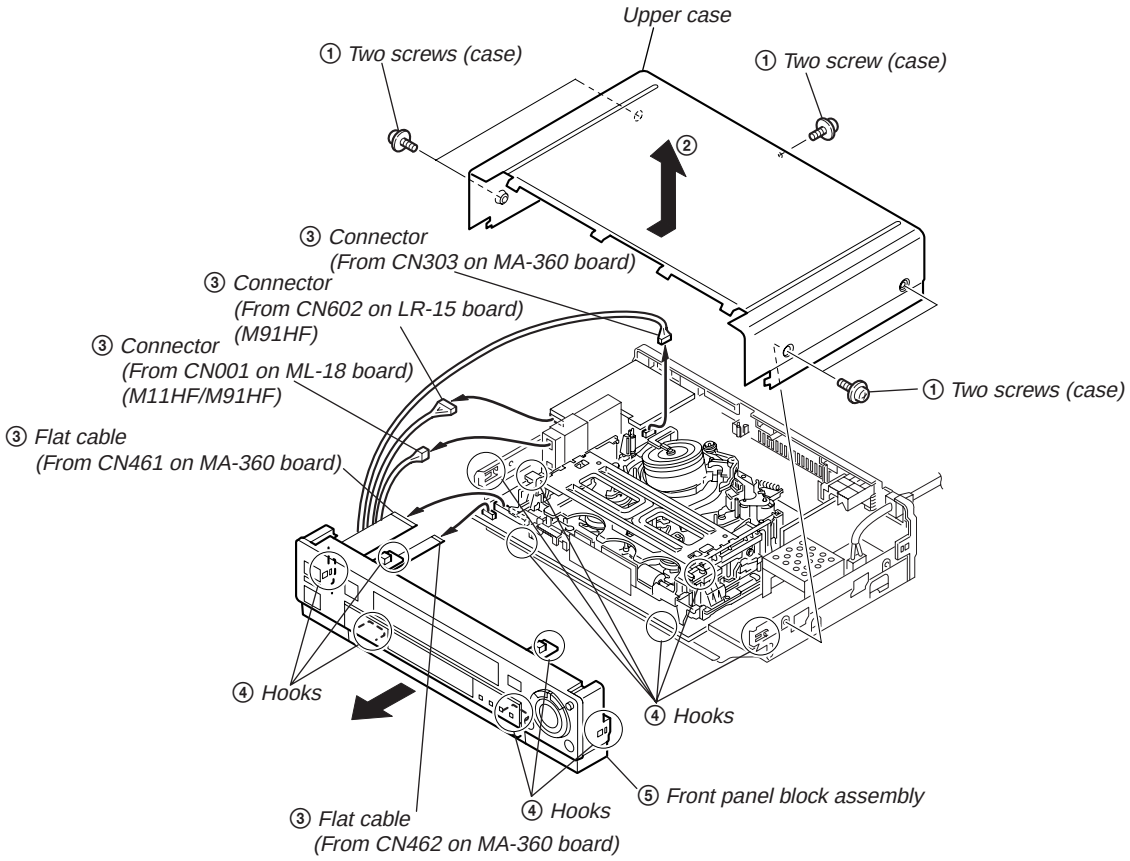


1 COUNTER/REMAIN button (8)
2 SP (Standard Play)/EP (Extended Play) button (7, 48)
3 AUDIO MONITOR button (27)
4 AUDIO/VIDEO INSERT buttons (41)
5 ▮► SLOW +/– buttons (19)
6 ×2 button (19)
7 TV/VIDEO button (8)
8 INPUT SELECT button (7, 9, 39)
9 TAPE RETURN button (20)
10 CLEAR button (5, 13, 25, 57)
11 DISPLAY button (8)
12 CH (channel) +/– buttons (7)
13 VOL (volume) +/– buttons
14 Receiver operation buttons
RECEIVER VOL (volume) +/– buttons
MUTING button

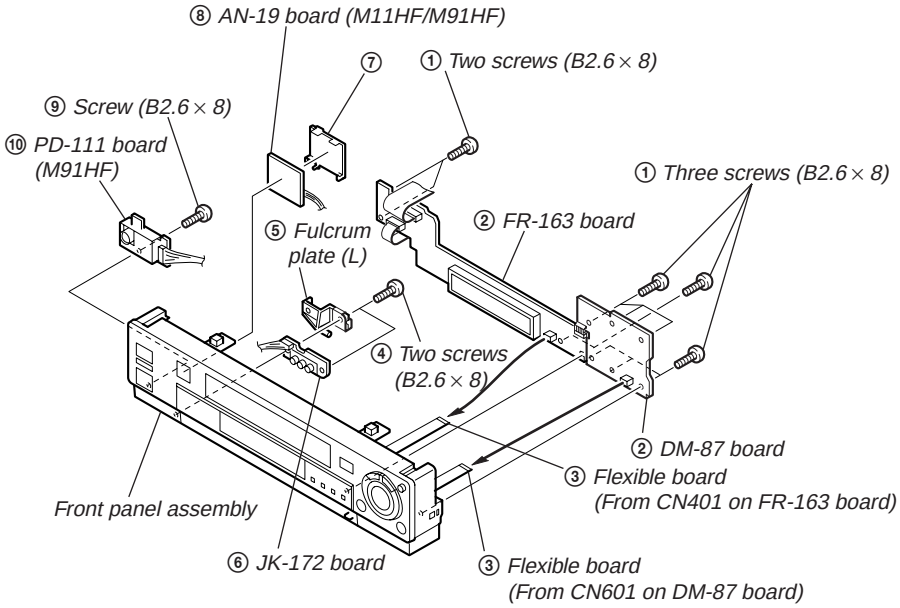
SECTION 2
DISASSEMBLY

NOTE: Follow the disassembly procedure in the numerical order given.

2-1. UPPER CASE, FRONT PANEL BLOCK ASSEMBLY

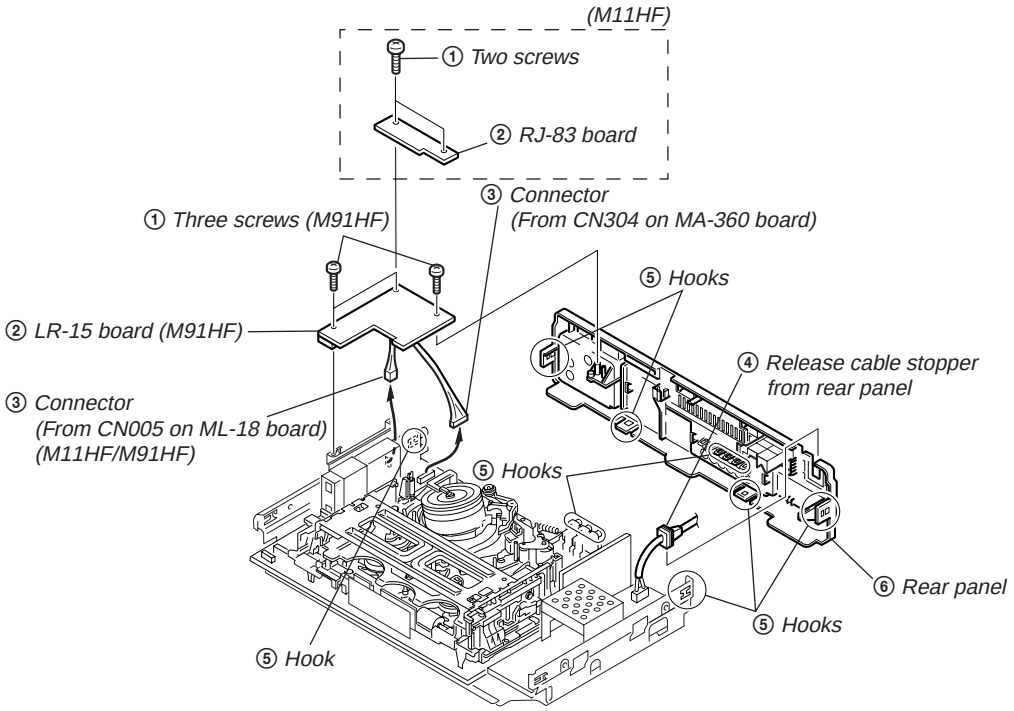


2-2. AN-19, DM-87, FR-163, JK-172, PD-111 BOARDS

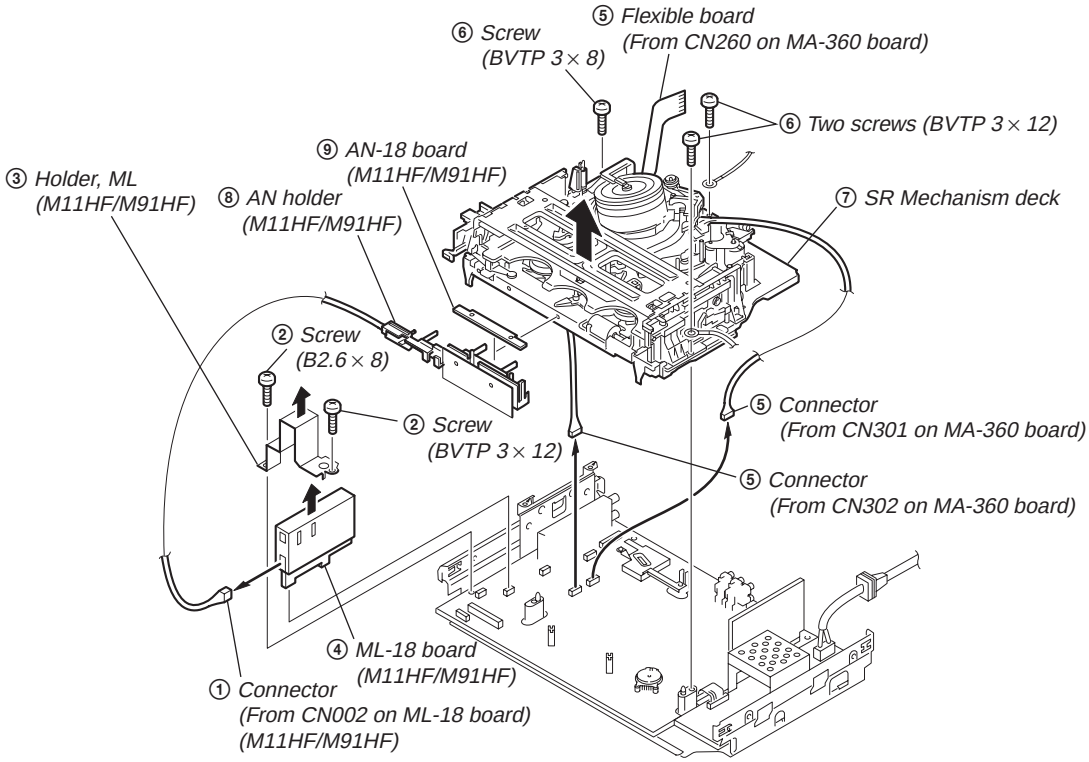


Note: *When peeling off the antenna (large) shield plate, XX-X board.*
If not so, the resonance level of AN-19 board becomes small.

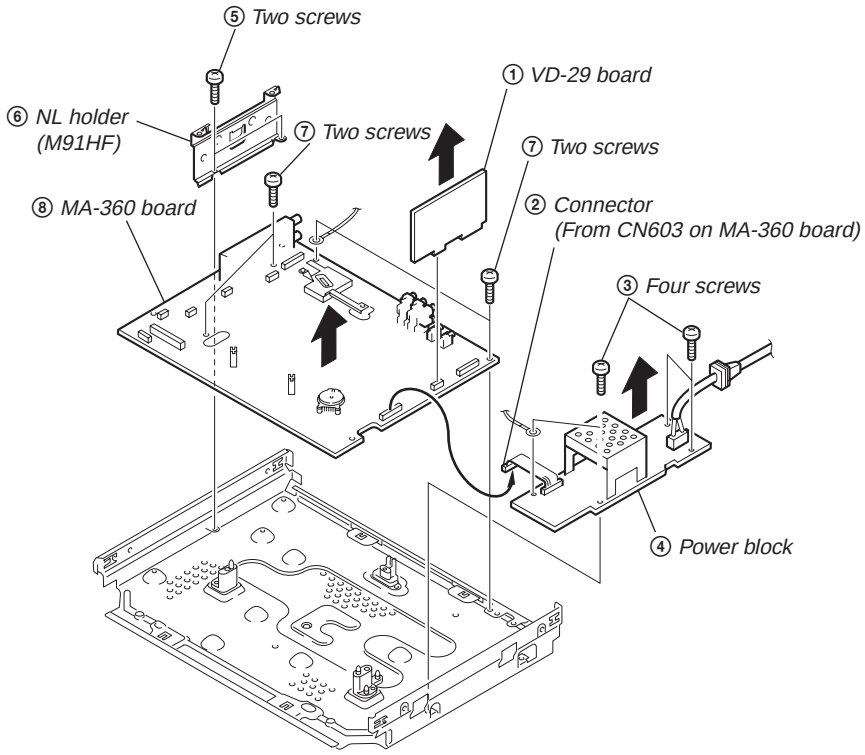
2-3. LR-15 BOARD, REAR PANEL



2-4. AN-18, ML-18 BOARDS, SR MECHANISM DECK

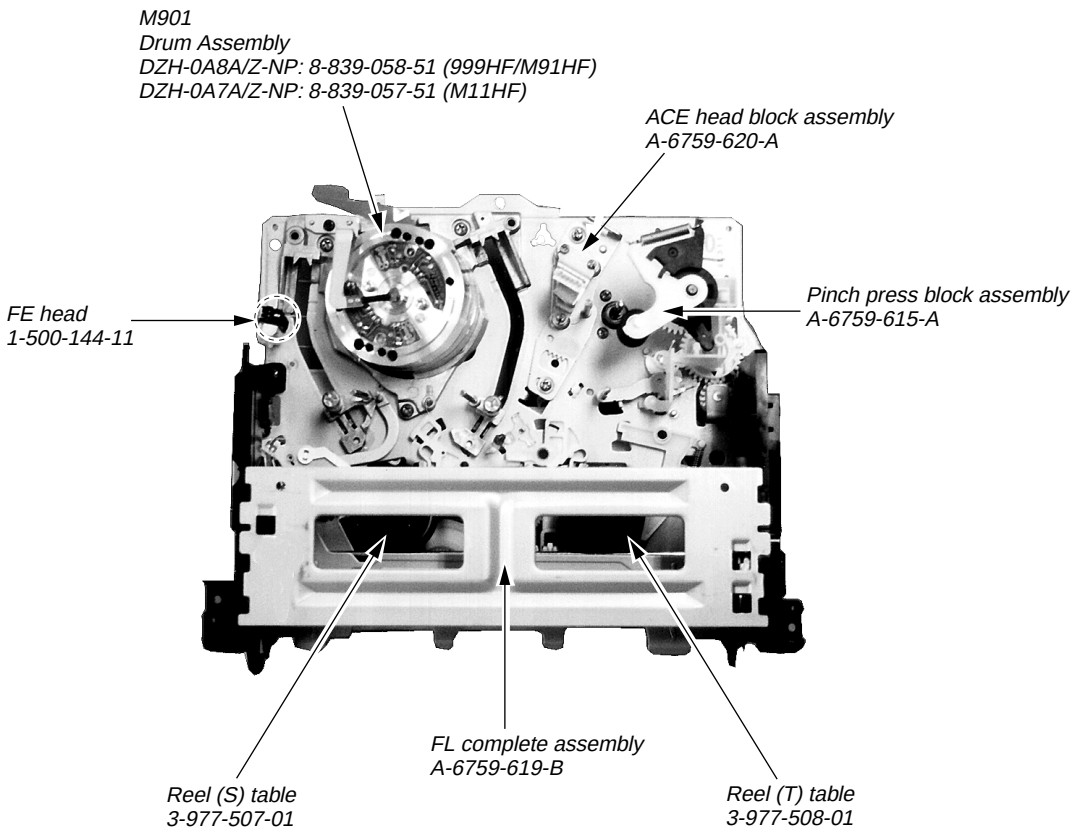


2-5. POWER BLOCK, MA-360 BOARD

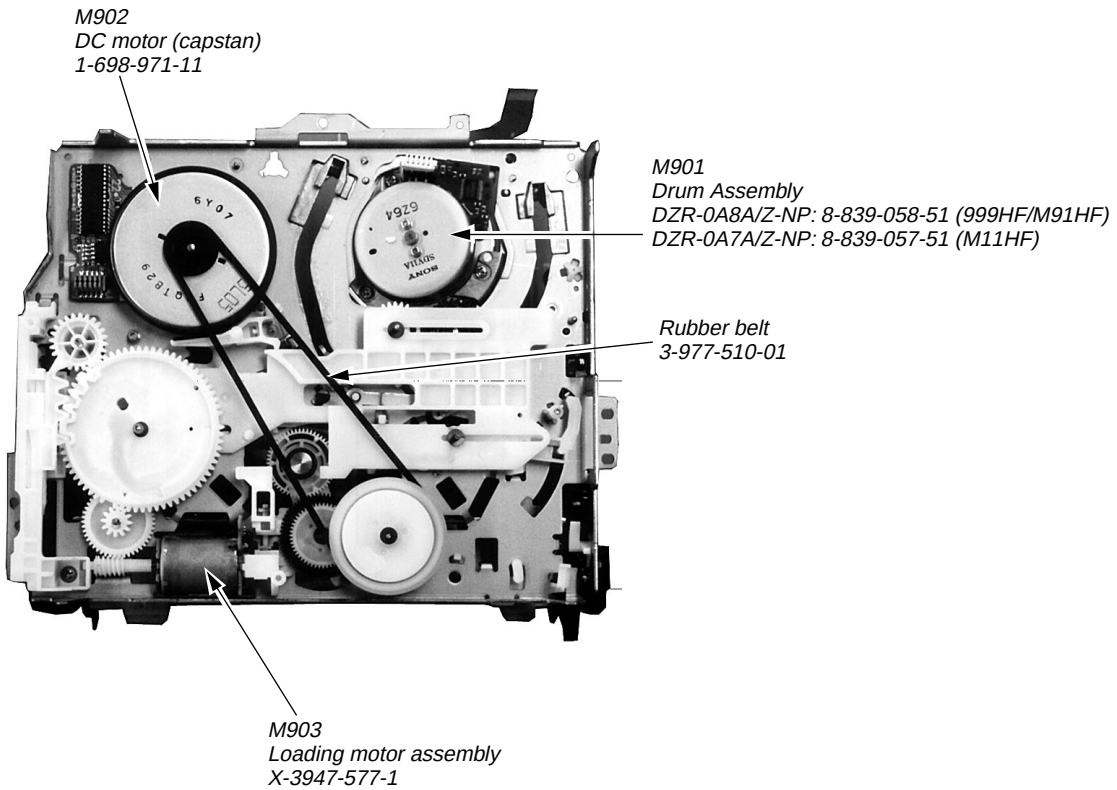


2-7. INTERNAL VIEWS

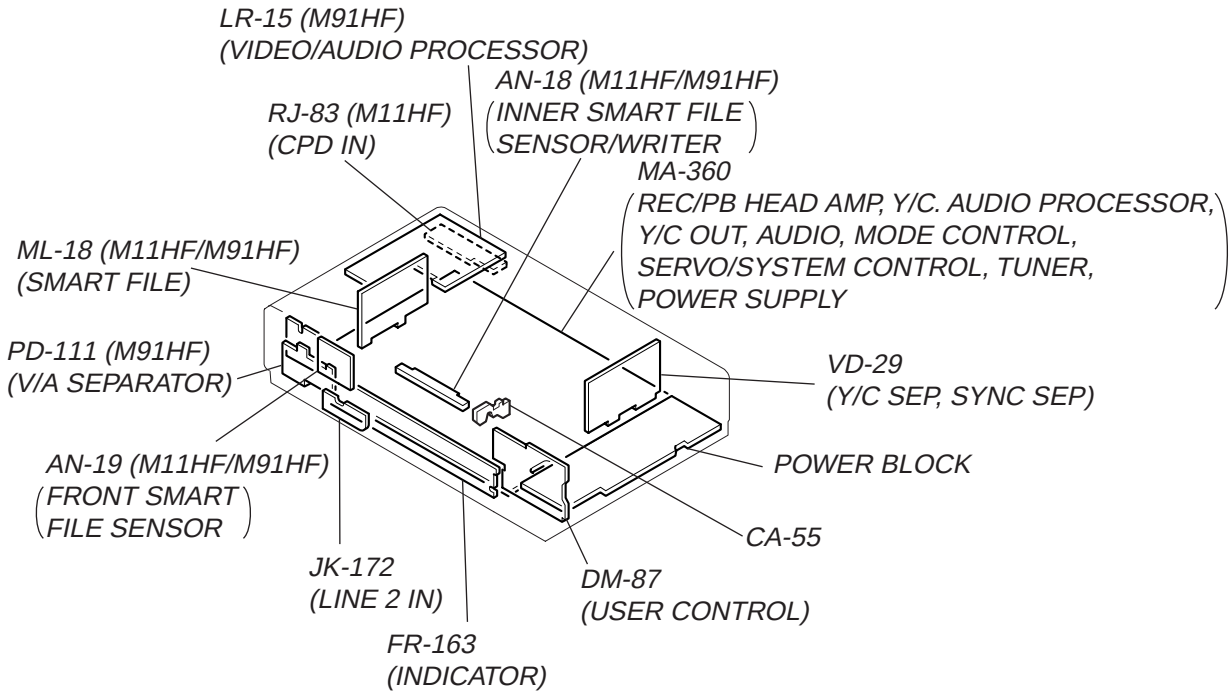
— Top View —



— Bottom View —

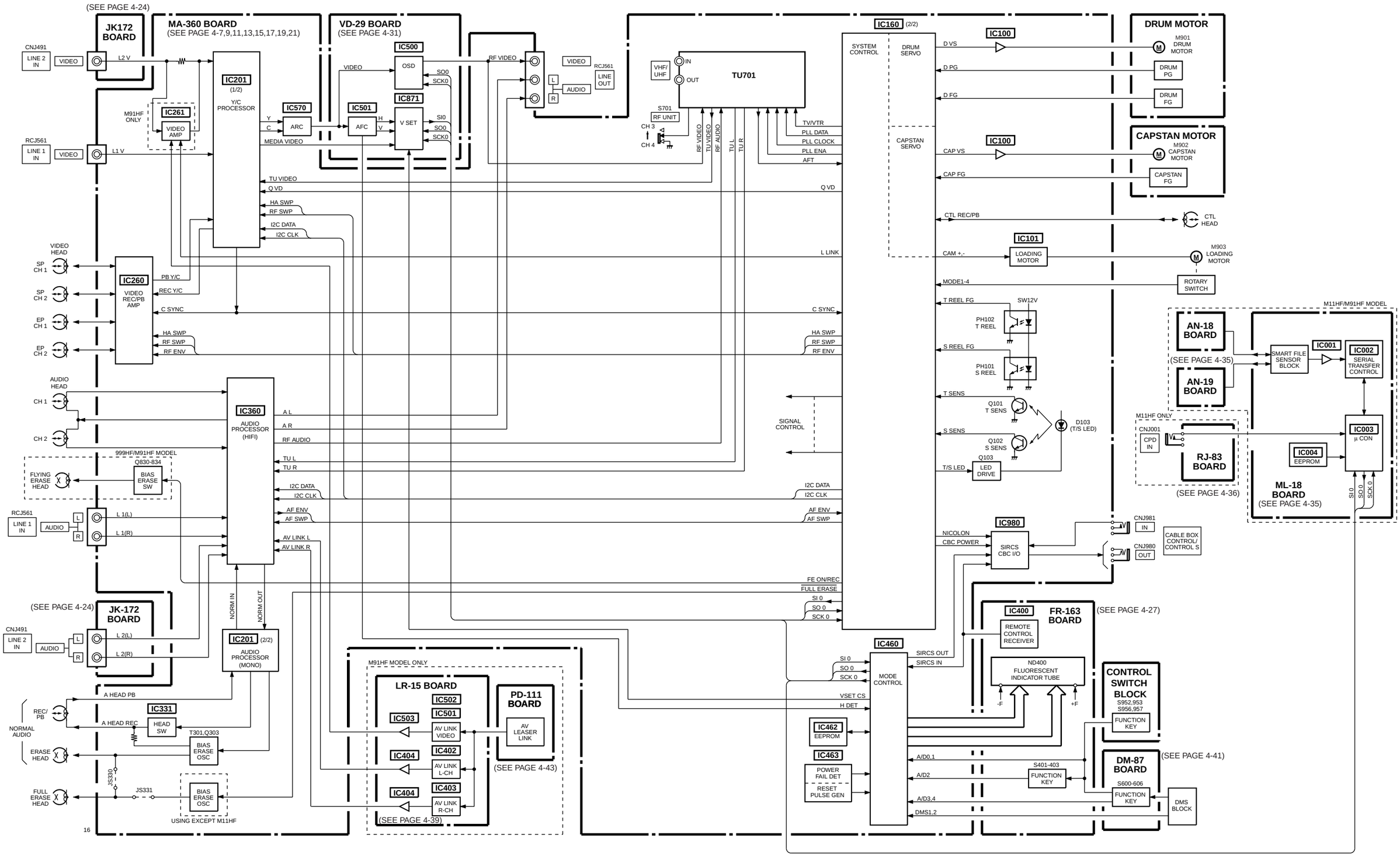


2-8. CIRCUIT BOARDS LOCATION

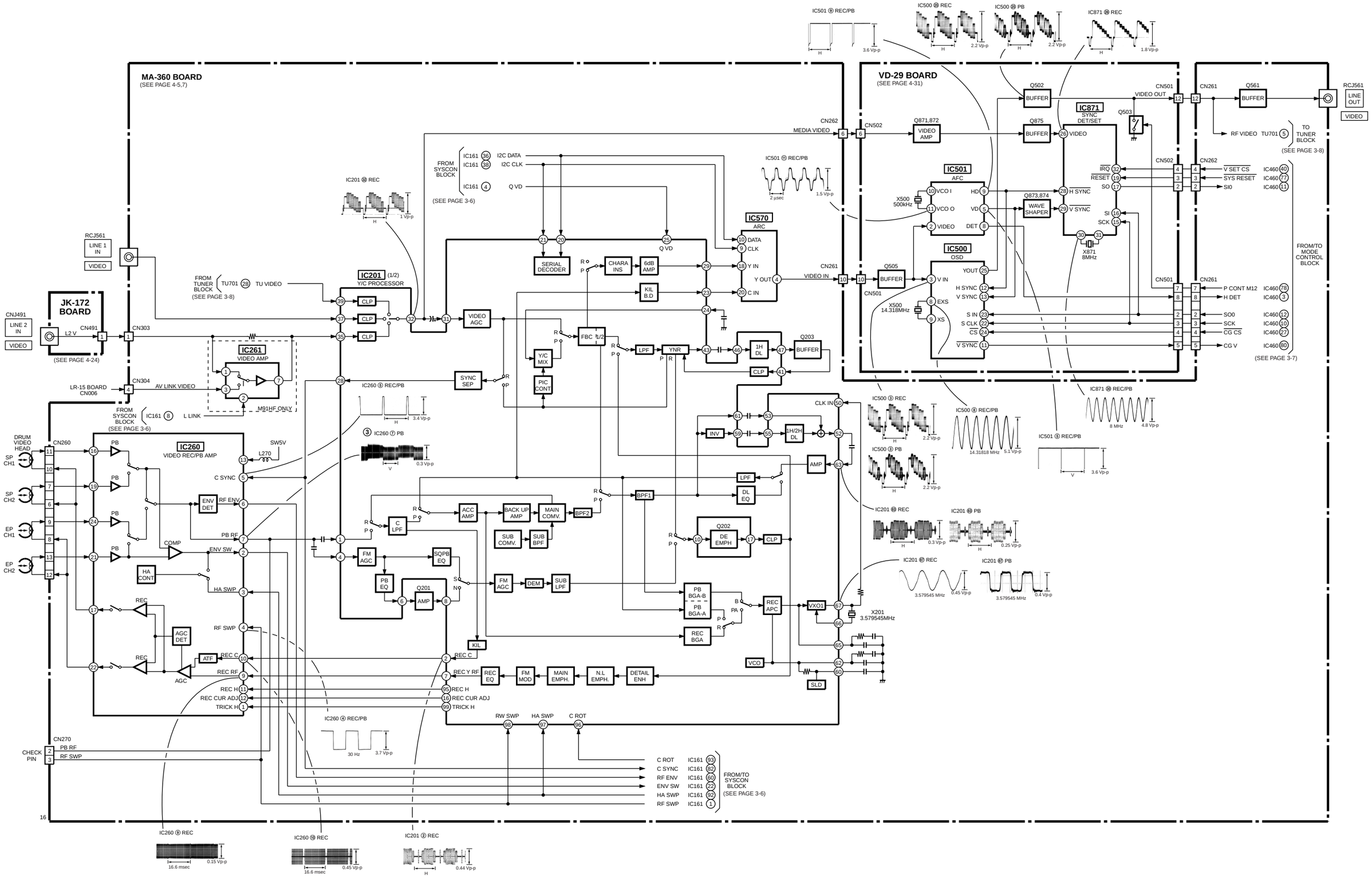


SECTION 3
BLOCK DIAGRAMS

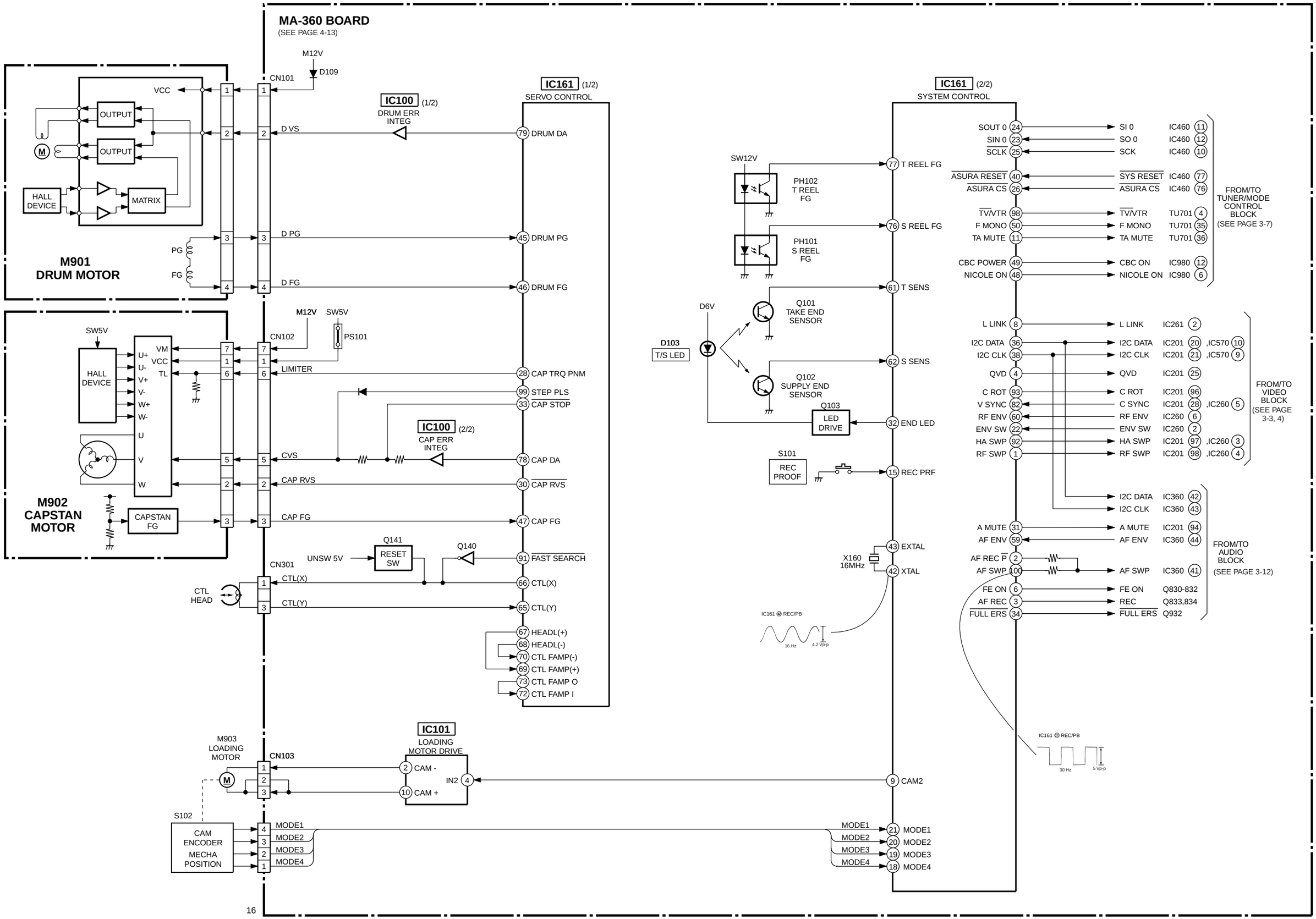
3-1. OVERALL BLOCK DIAGRAMS



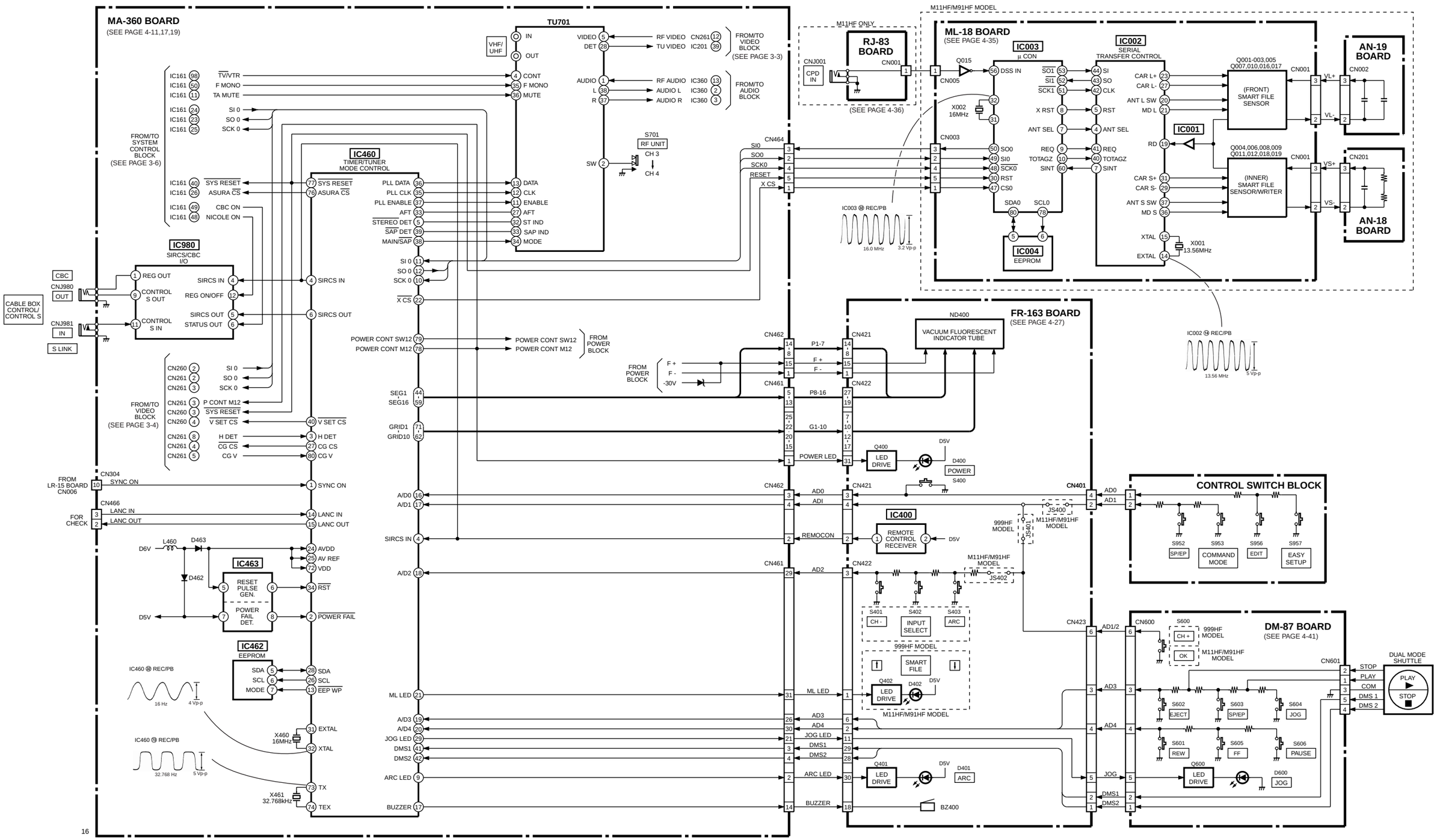
3-2. VIDEO BLOCK DIAGRAM



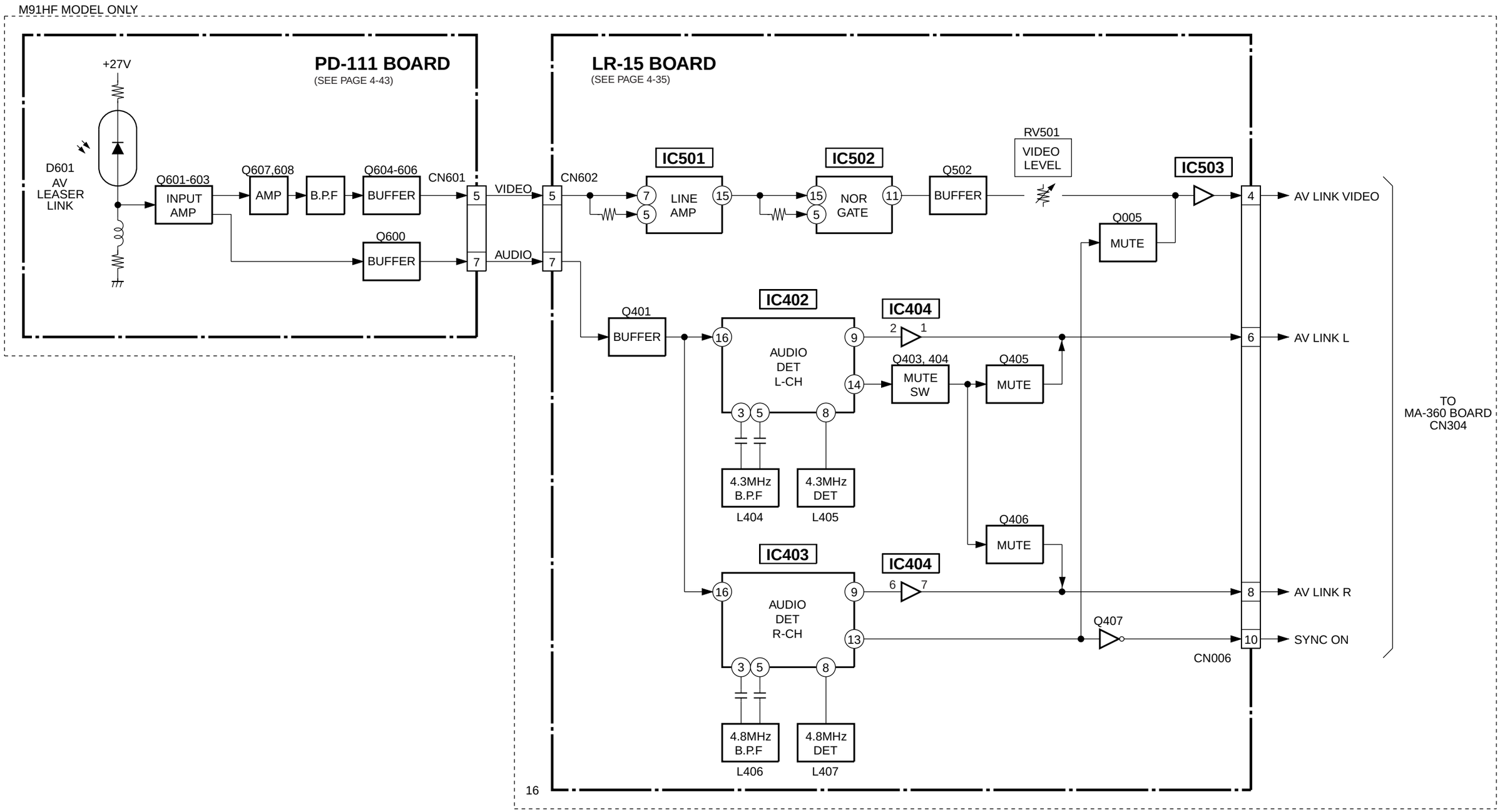
3-3. SYSTEM CONTROL BLOCK DIAGRAM



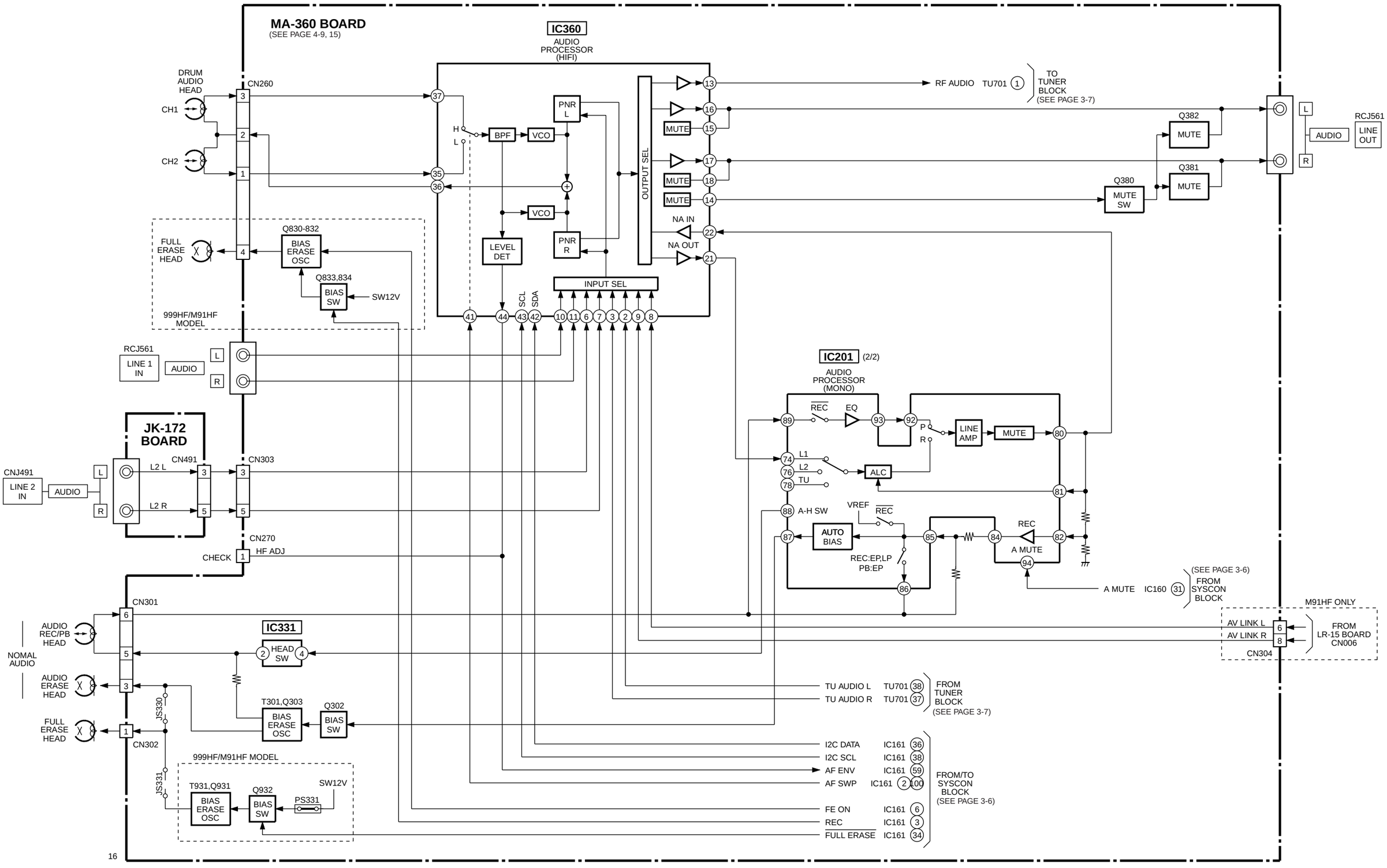
3-4. MODE CONTROL BLOCK DIAGRAM



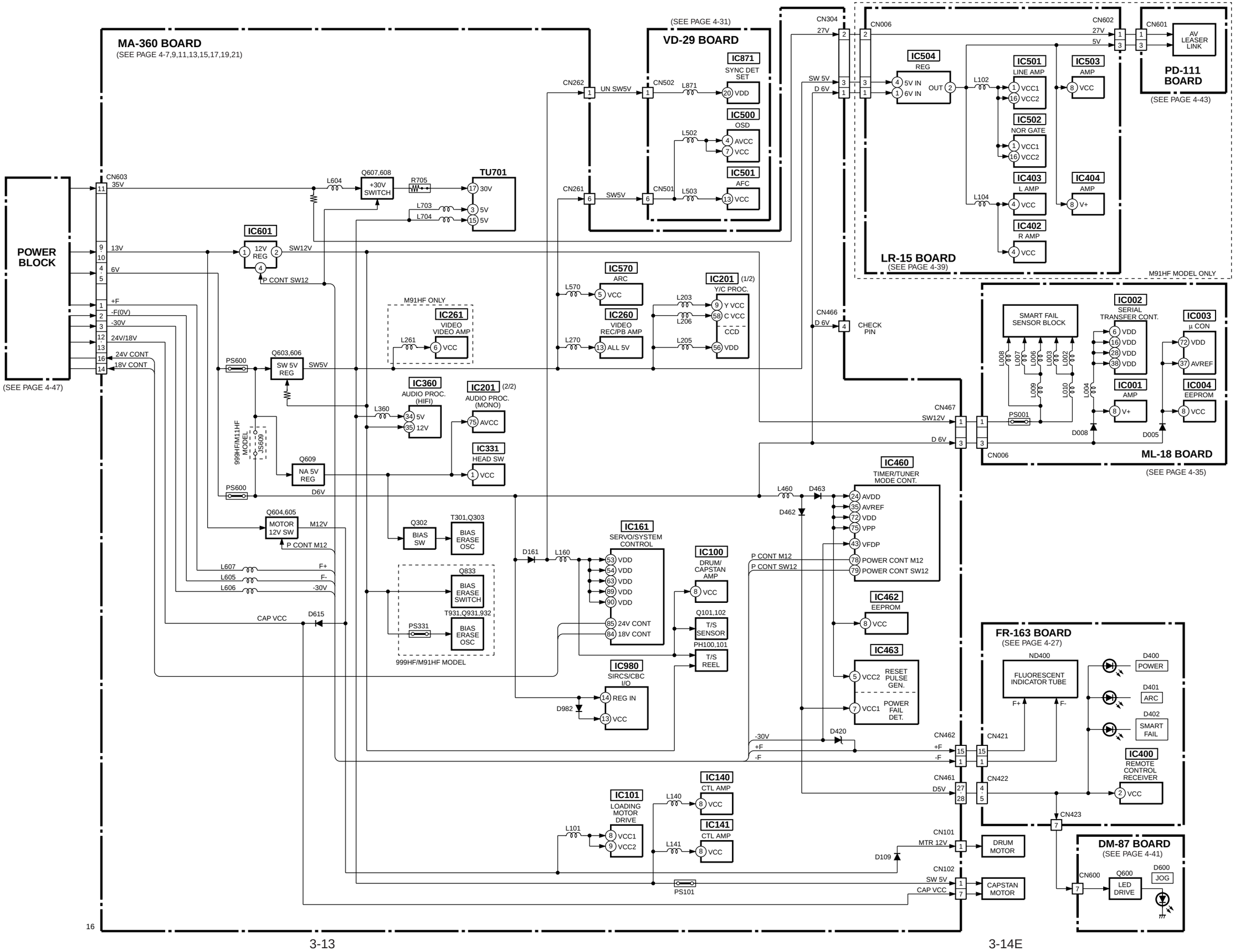
3-5. AV LINK BLOCK DIAGRAM



3-6. AUDIO BLOCK DIAGRAM



3-7. POWER BLOCK DIAGRAM

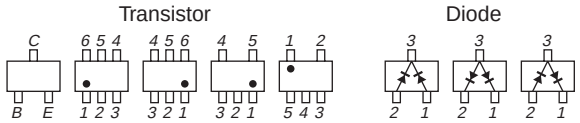


SECTION 4
PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS

THIS NOTE IS COMMON FOR WIRING BOARDS AND SCHEMATIC DIAGRAMS
(In addition to this, the necessary note is printed in each block)

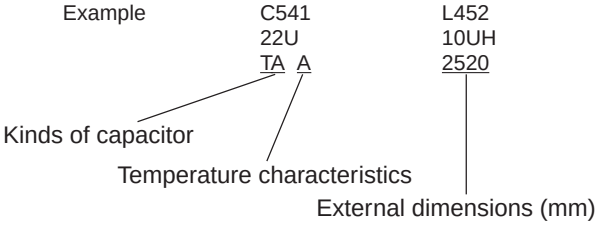
(For printed wiring boards)

- ▒▒: Pattern from the side which enables seeing.
  (The other layers' patterns are not indicated.)
- Through hole is omitted.
- Circled numbers refer to waveforms.
- There are few cases that the part printed on diagram isn't mounted in this model.
- Chip parts.



(For schematic diagrams)

- All capacitors are in μF unless otherwise noted. pF : μμF. 50 V or less are not indicated except for electrolytics and tantalums.
- Chip resistors are 1/10W unless otherwise noted.
  kΩ = 1000 Ω, MΩ = 1000 kΩ.
- Caution when replacing chip parts.
  New parts must be attached after removal of chip.
  Be careful not to heat the minus side of tantalum capacitor, Because it is damaged by the heat.
- Some chip part will be indicated as follows.

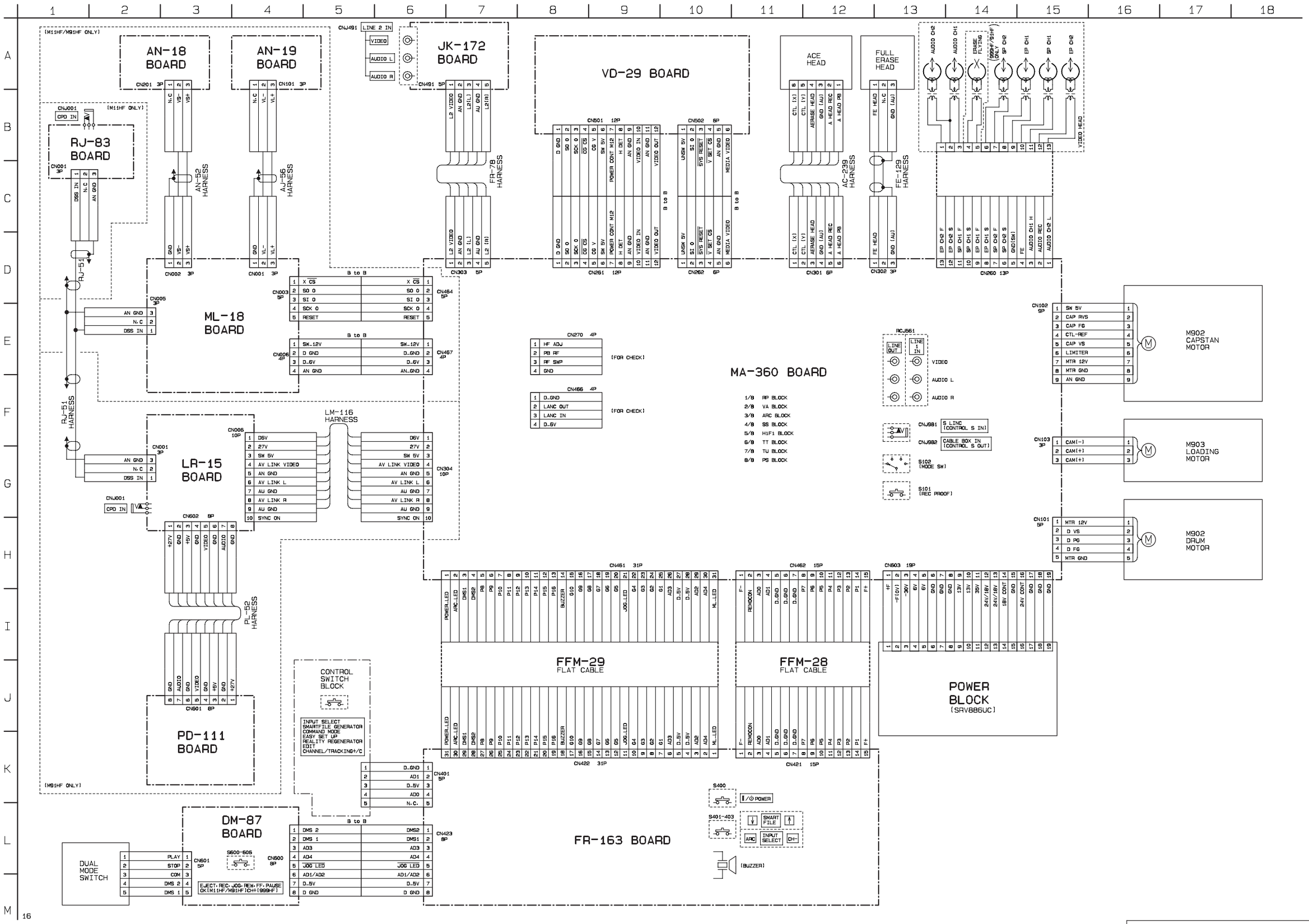


- Constants of resistors, capacitors, ICs and etc with XX indicate that they are not used.
  In such cases, the unused circuits may be indicated.
- Parts with * differ according to the model/destination.
  Refer to the mount table for each function.
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.
- Signal name
  XEDIT → $\overline{\text{EDIT}}$ PB/XREC → PB/$\overline{\text{REC}}$
- : non flammable resistor
- : fusible resistor
- : panel designation
- **B +** : B+ Line
- **B −** : B– Line
- : adjustment for repair.
- Circled numbers refer to waveforms.
- Readings are taken with a color-bar signal input.
- Voltage are dc between ground and measurement points.
- Readings are taken with a digital multimeter (DC 10 MΩ).
- Voltage variations may be noted due to normal production tolerances.

When indicating parts by reference number, pleas include the board name.

Note :	**Note :**
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.	Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

4-1. FRAME SCHEMATIC DIAGRAM

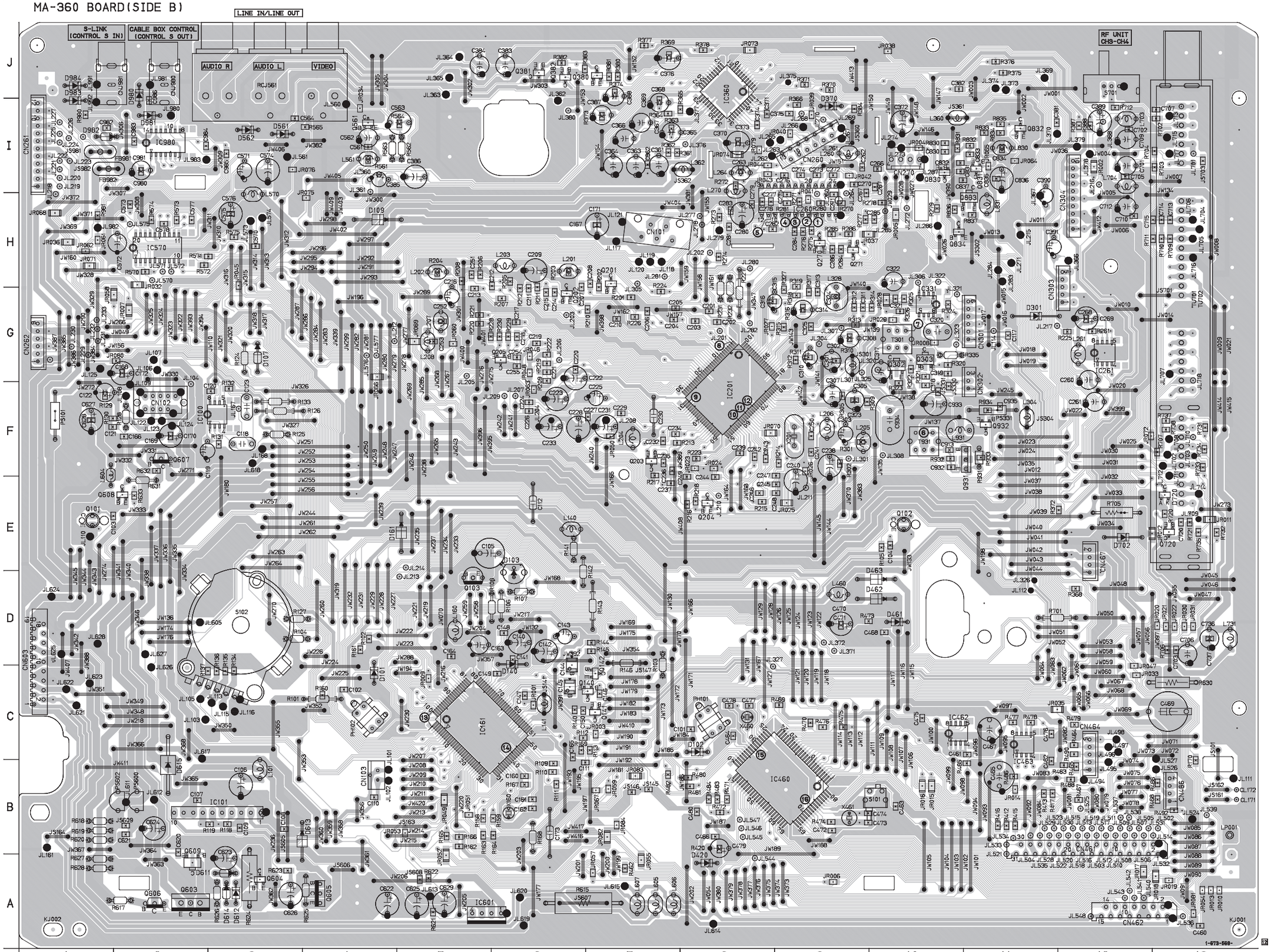


4-2. PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS

MA-360 (REC/PB HEAD AMP, Y/C. AUDIO PROCESSOR, Y/C OUT, SERVO/SYSTEM CONTROL, AUDIO, MODE CONTROL, TUNER, POWER SUPPLY) PRINTED WIRING BOARD

— Ref. No. MA-360 Board; 1,000 Series —

MA-360 BOARD(SIDE B)



MA-360 BOARD

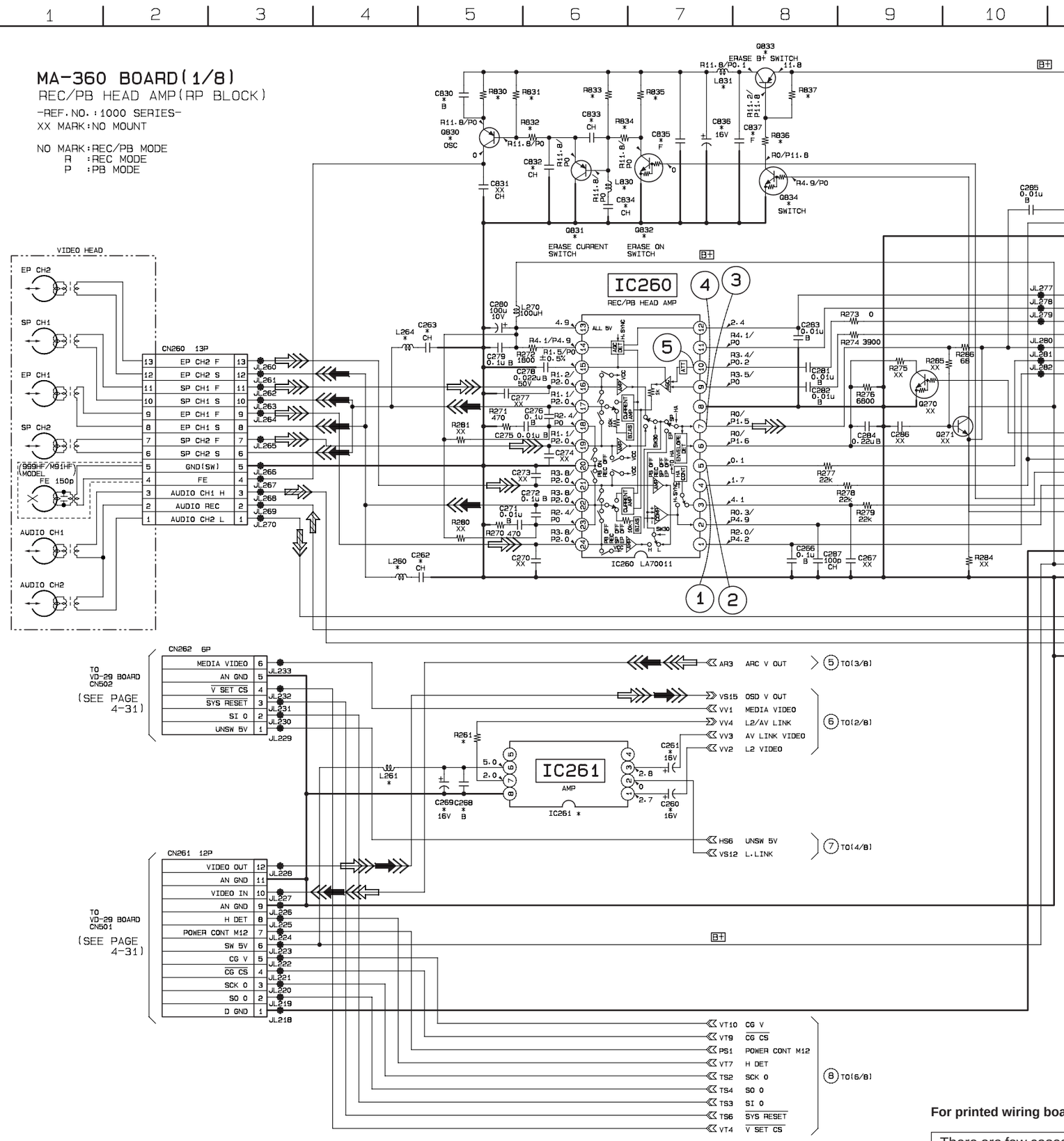
CN101	H-7	IC161	C-5	J
CN102	F-2	IC201	F-8	
CN103	B-4	IC260	H-9	
CN260	I-9	IC261	G-12	
CN261	I-1	IC331	G-10	
CN262	G-1	IC360	J-8	
CN270	I-10	IC460	B-9	
CN301	G-10	IC462	C-10	
CN302	F-10	IC463	C-11	I
CN303	G-11	IC570	H-2	
CN304	H-12	IC601	A-5	
CN461	B-12	IC980	I-2	
CN462	A-12			
CN464	C-12	Q101	E-1	
CN466	B-13	Q102		
CN467	E-12	Q103	D-5	
CN603	C-1	Q140	C-6	
		Q141	C-7	H
D101	C-4	Q142	C-7	
D102	C-8	Q201	G-7	
D103	D-6	Q202	G-6	
D107	G-3	Q203	F-7	
D109	H-4	Q302	G-10	
D140	C-6	Q303	G-10	
D161		Q380	J-7	
D301	G-11	Q381	J-6	G
D420	A-8	Q382	J-6	
D462	D-10	Q561	I-4	
D463	D-10	Q603	A-2	
D562	I-3	Q604	A-3	
D611	A-3	Q605	A-4	
D612	A-3	Q606	A-2	
D614	A-3	Q607	F-2	
D615	B -2	Q608	E-8	
D702	E-12	Q609	A-2	F
D980	I-2	Q830	I-10	
D981	I-2	Q831	I-11	
D982	I-1	Q832	I-11	
D983	I-1	Q833	H-10	
D984	J-1	Q834	H-10	
		Q931	F-10	
IC100	F-3	Q932	F-11	
IC101	B-3			

MA-360 BOARD(1/8)

REC/PB HEAD AMP(RP BLOCK)

-REF.NO.:1000 SERIES-
XX MARK:NO MOUNT

NO MARK:REC/PB MODE
R :REC MODE
P :PB MODE

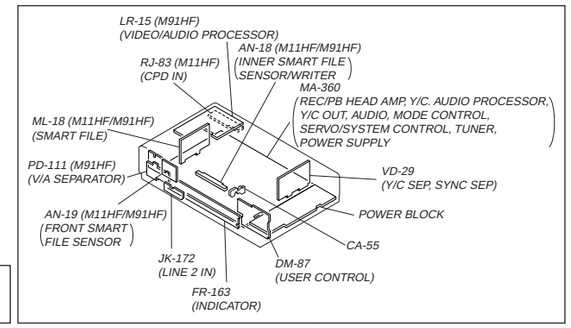


*MARKED*MOUNT TABLE

REF.NO. \ MODEL	M11HF	999HF	M91HF
C260	XX	XX	47u 16V
C261	XX	XX	47u 16V
C262	XX	18p 50V CH	
C263	XX	18p 50V CH	
C268	XX	XX	0.01u 50V B
C269	XX	XX	47u 16V
C830	XX	0.01u 50V B	
C832	XX	100p 50V CH	
C833	XX	150p 50V CH	
C834	XX	56p 50V CH	
C835	XX	0.1u 25V F	
C836	XX	47u 16V	
C837	XX	0.1u 25V F	
IC261	XX	XX	MM1111XFBE
L260	XX	10uH	
L261	XX	XX	22uH
L264	XX	10uH	
L830	XX	6.8uH	
L831	XX	100uH	
Q830	XX	2SA812-T1M	
Q831	XX	2SA812-T1M	
Q832	XX	MUN2213T1	
Q833	XX	2SB1122-ST	
Q834	XX	MUN2213T1	
R261	XX	XX	0
R830	XX	27	
R831	XX	470	
R832	XX	1500	
R833	XX	82k	
R834	XX	47k	
R835	XX	39k	
R836	XX	3300	
R837	XX	10k	

•SIGNAL PATH

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC	➡	➡	➡	⇨
PB			⇨	⇨

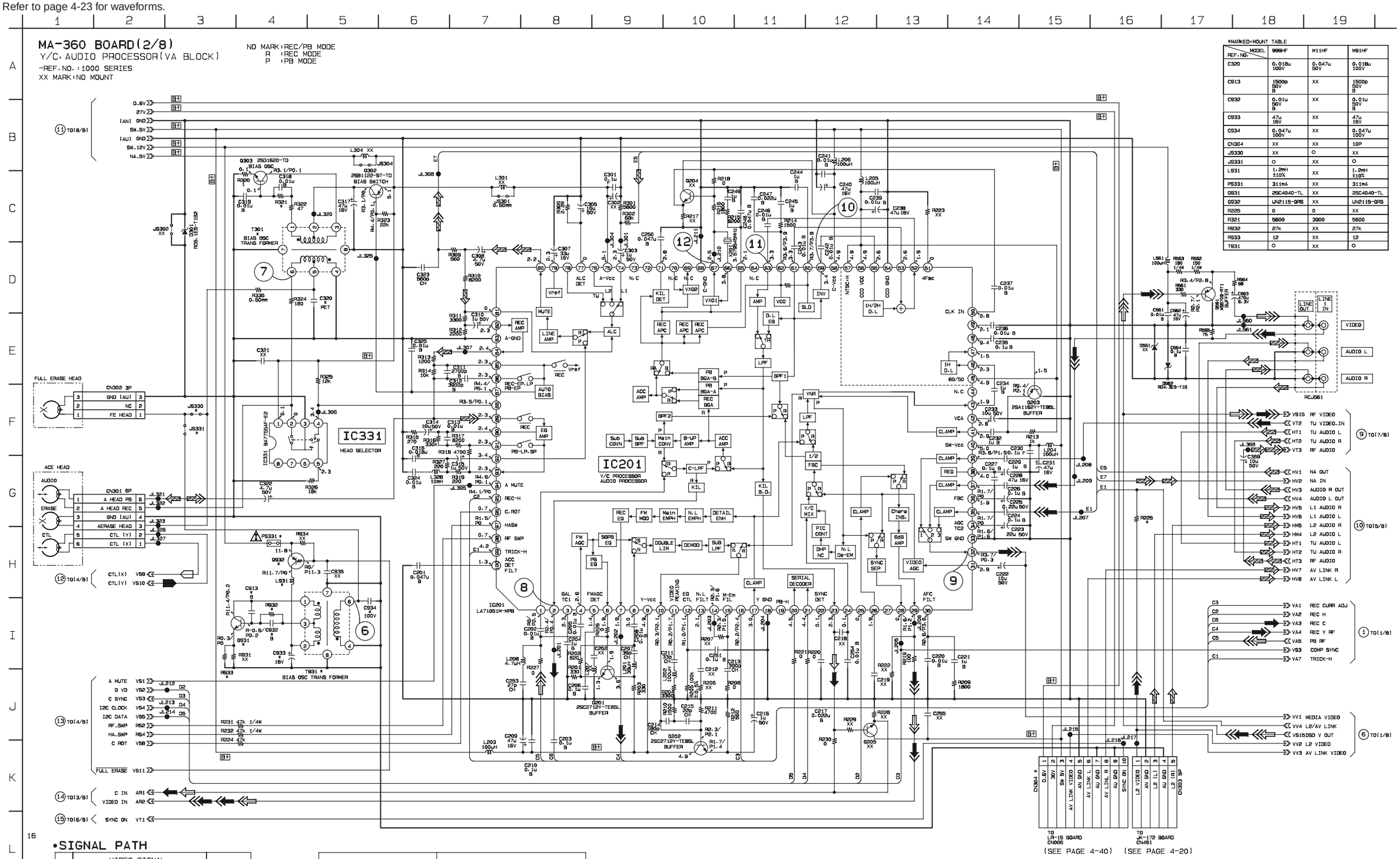


For printed wiring boards

There are few cases that the part printed on this diagram isn't mounted in this model.

For schematic diagram

- Refer to page 4-5 for printed wiring board.
- Refer to page 4-23 for waveforms.



*MARKED*MOUNT TABLE

MODEL / REF.NO.	999HF	M11HF	M91HF
C320	0.018u 100V	0.047u 50V	0.018u 100V
C913	1500p 50V B	XX	1500p 50V B
C932	0.01u 50V B	XX	0.01u 50V B
C933	47u 16V	XX	47u 16V
C934	0.047u 100V	XX	0.047u 100V
CN304	XX	XX	10P
JS330	XX	O	XX
JS331	O	XX	O
L931	1.2mH ±10%	XX	1.2mH ±10%
PS331	311mA	XX	311mA
Q931	2SC4040-TL	XX	2SC4040-TL
Q932	UN2115-QRS	XX	UN2115-QRS
R225	0	0	XX
R321	5600	3900	5600
R932	27k	XX	27k
R933	12	XX	12
T931	O	XX	O

•SIGNAL PATH

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC	➡	➡	➡	⇨
PB	⇨	⇨	⇨	⇨

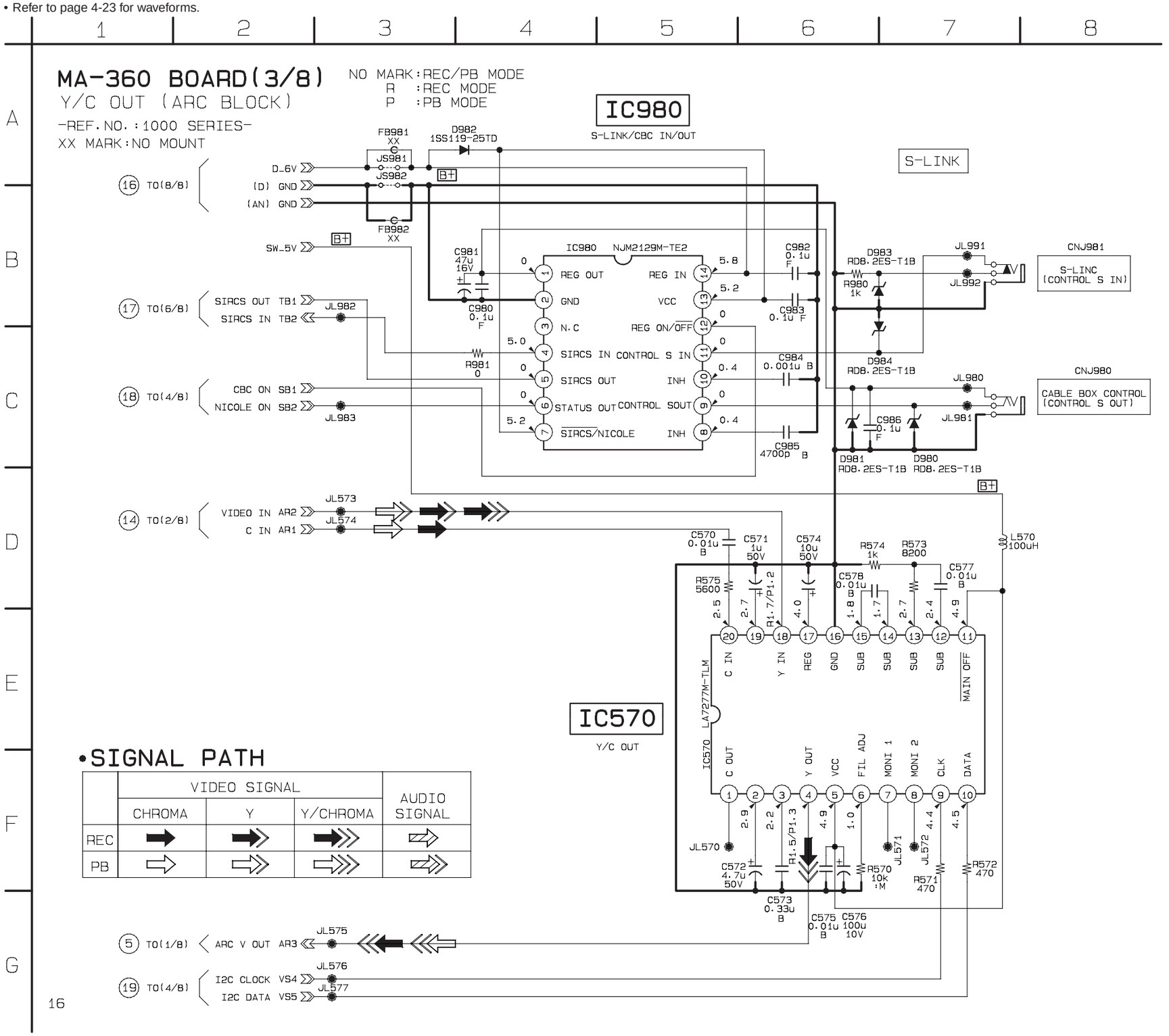
•SIGNAL PATH

	REC	REC/PB	PB
Servo ref.signal	◀		▷

Note:
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

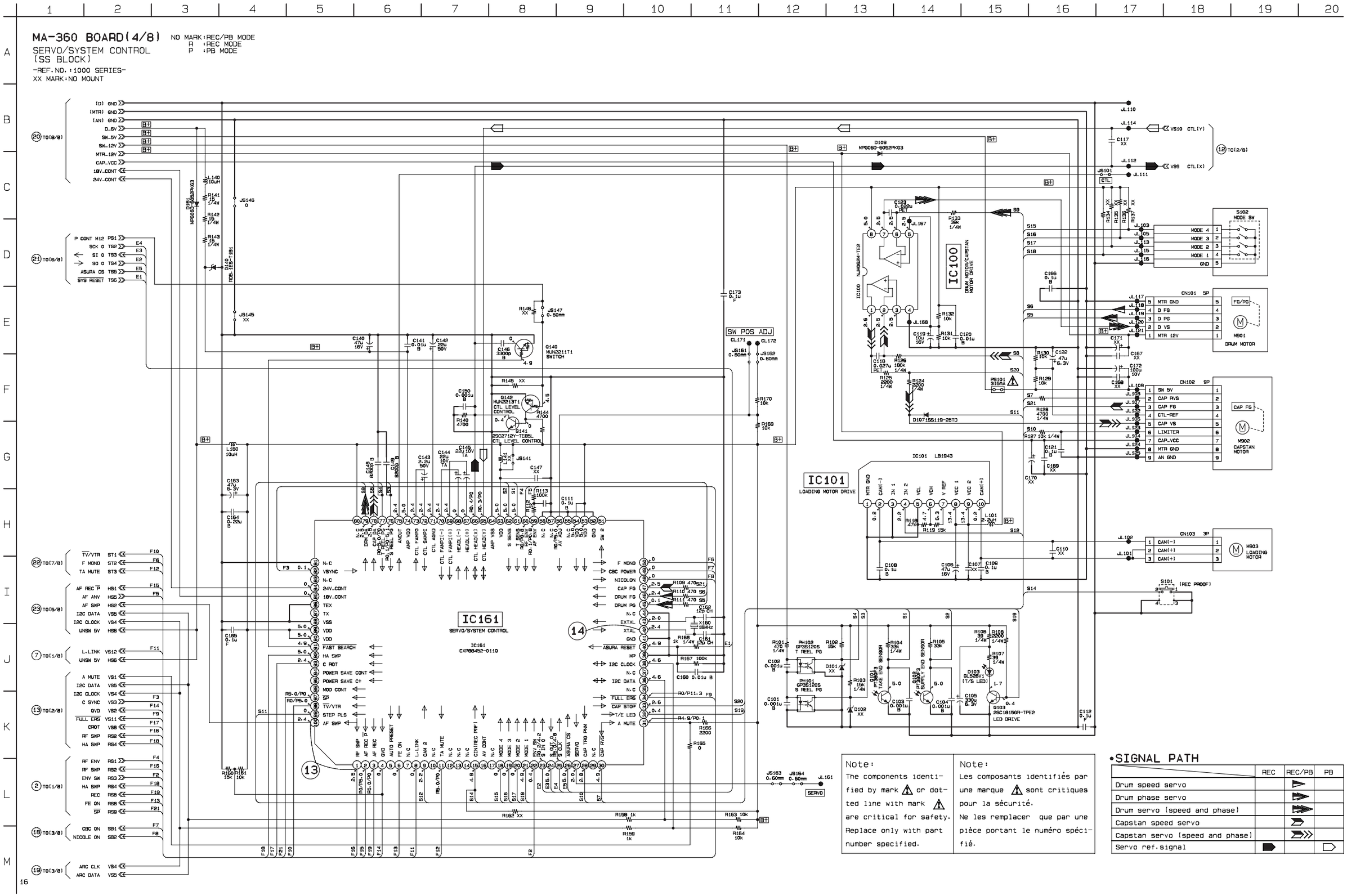
Note:
Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

For schematic diagram
- Refer to page 4-5 for printed wiring board.
- Refer to page 4-23 for waveforms.



For schematic diagram

- Refer to page 4-5 for printed wiring board.
- Refer to page 4-23 for waveforms.



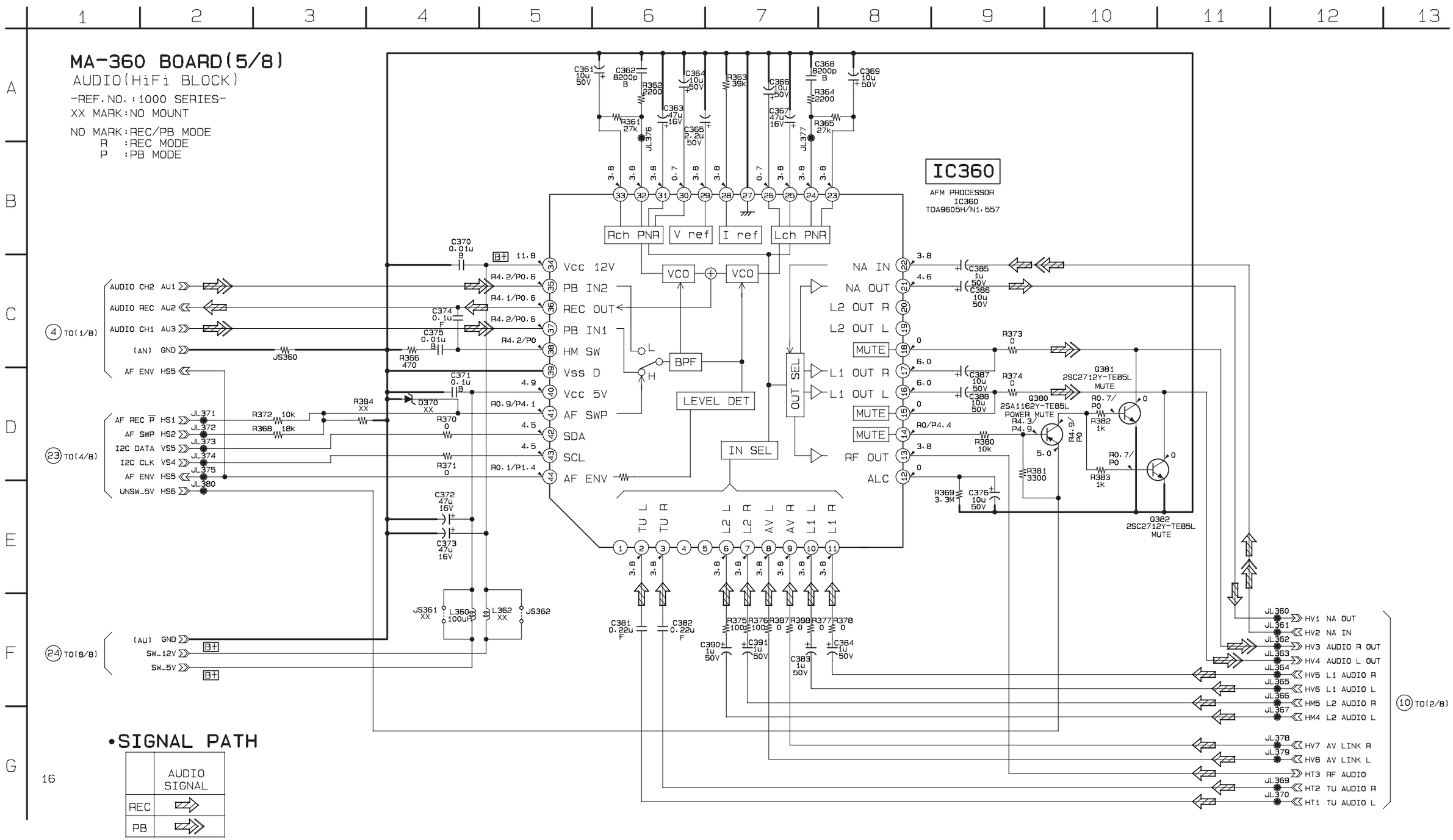
Note:	Note:
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.	Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

•SIGNAL PATH

	REC	REC/PB	PB
Drum speed servo		▷	
Drum phase servo		▶	
Drum servo (speed and phase)		▶▶	
Capstan speed servo		⊃	
Capstan servo (speed and phase)		⊃»	
Servo ref.signal	▶		▷

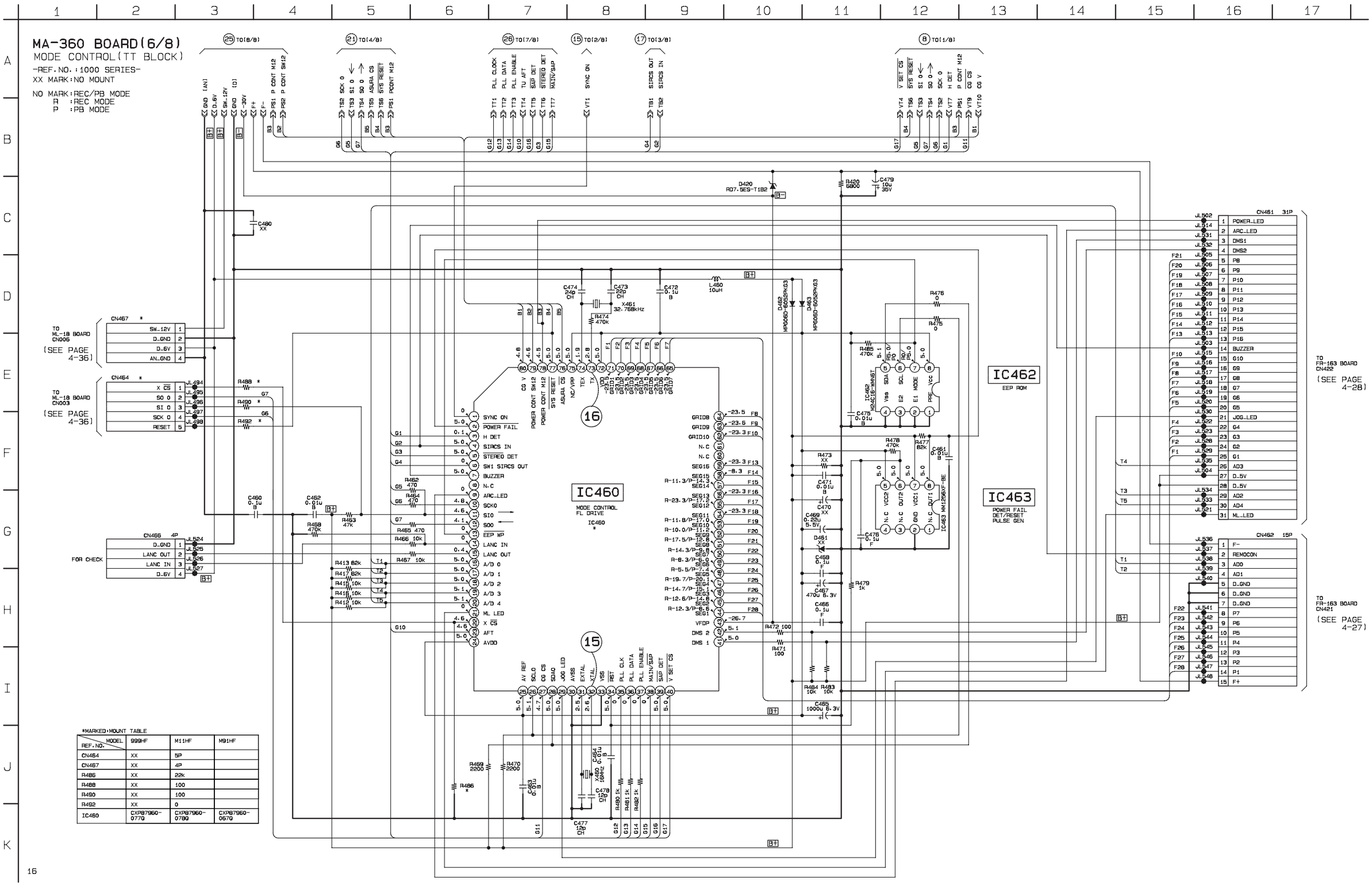
SERVO/SYSTEM CONTROL
MA-360 (4/8)

For schematic diagram
- Refer to page 4-5 for printed wiring board.
- Refer to page 4-23 for waveforms.



For schematic diagram

- Refer to page 4-5 for printed wiring board.
- Refer to page 4-23 for waveforms.

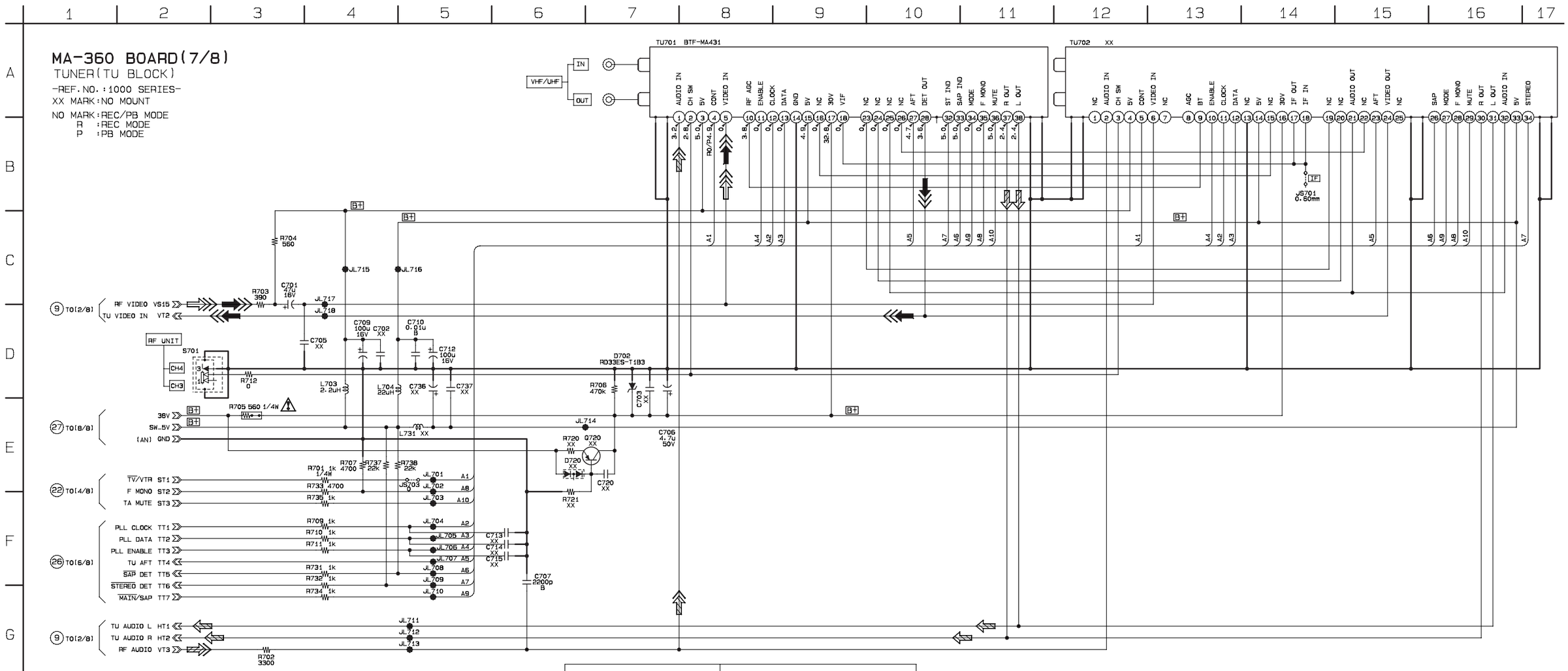


For schematic diagram
- Refer to page 4-5 for printed wiring board.
- Refer to page 4-23 for waveforms.

MA-360 BOARD(7/8)

TUNER(TU BLOCK)

-REF.NO.:1000 SERIES-
XX MARK:NO MOUNT
NO MARK:REC/PB MODE
R :REC MODE
P :PB MODE



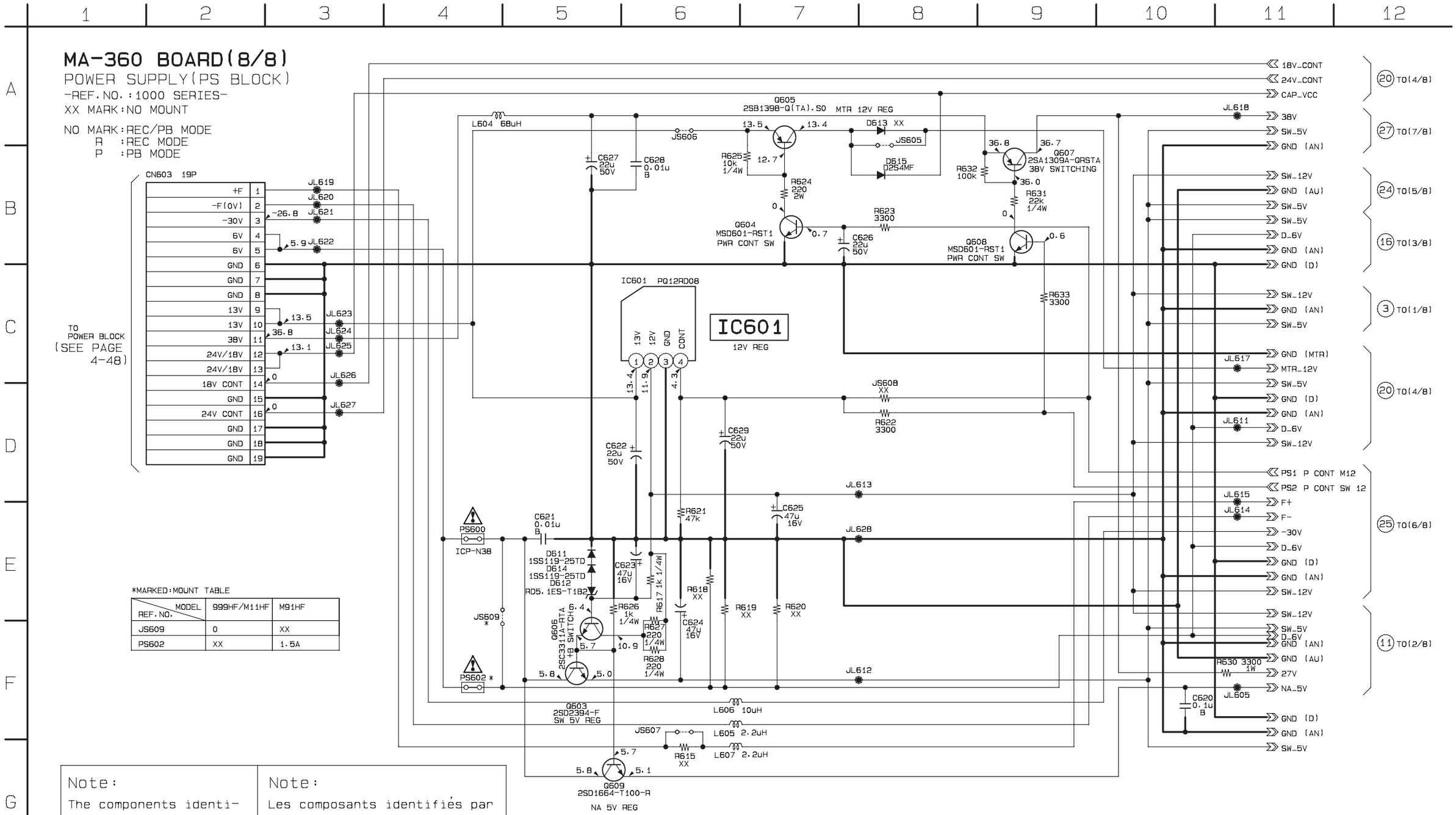
•SIGNAL PATH

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC			➡	⇨
PB			⇨	⇨

Note:
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

Note:
Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

For schematic diagram
- Refer to page 4-5 for printed wiring board.
- Refer to page 4-23 for waveforms.



*MARKED:MOUNT TABLE

REF.NO. \ MODEL	999HF/M11HF	M91HF
JS609	0	XX
PS602	XX	1.5A

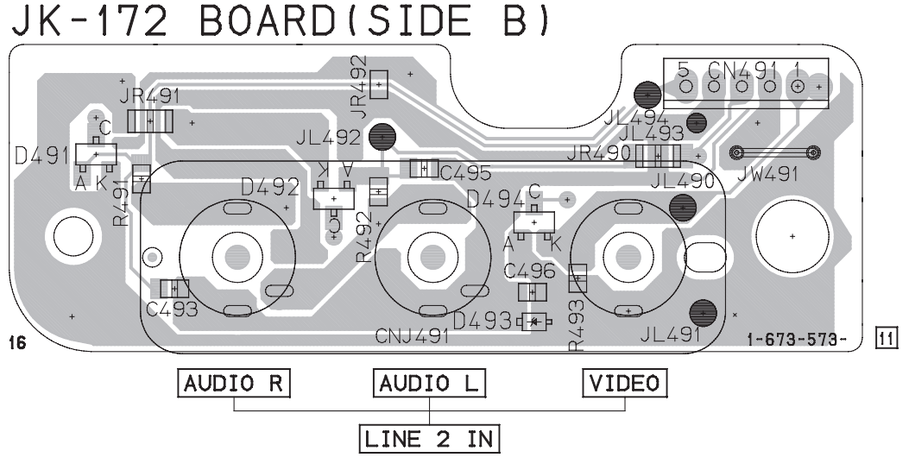
Note:	Note:
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.	Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

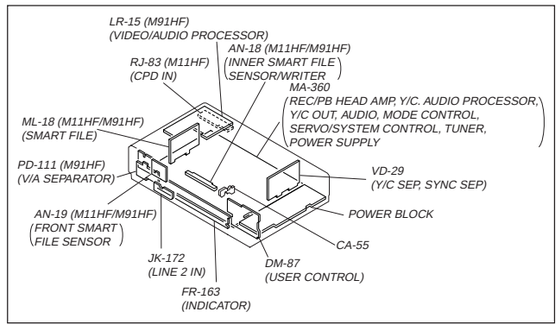
MA-360 BOARD

① IC260 ④ REC/PB 30 Hz 3.7 Vp-p	⑧ IC201 ② REC H 0.44 Vp-p	⑫ IC201 ⑥⑦ PB 3.579545 MHz 0.4 Vp-p
② IC260 ⑤ REC/PB H 3.4 Vp-p	⑨ IC201 ㉜ REC H 1 Vp-p	⑬ IC161 ⑩⓪ REC/PB 30 Hz 5 Vp-p
③ IC260 ⑦ PB V 0.3 Vp-p	⑩ IC201 ⑤⑨ REC H 0.15 Vp-p	⑭ IC161 ④② REC/PB 16 Hz 4.2 Vp-p
④ IC260 ⑨ REC 16.6 msec 0.15 Vp-p	⑩ IC201 ⑤⑨ PB H 0.3 Vp-p	⑮ IC460 ㉜ REC/PB 16 Hz 4 Vp-p
⑤ IC260 ⑩ REC 16.6 msec 0.45 Vp-p	⑪ IC201 ⑥③ REC H 0.3 Vp-p	⑯ IC460 ⑦③ REC/PB 32.768 Hz 5 Vp-p
⑥ T931 ⑥ REC 70 kHz 52 Vp-p	⑪ IC201 ⑥③ PB H 0.25 Vp-p	
⑦ T301 ⑥ REC 70 kHz 52 Vp-p	⑫ IC201 ⑥⑦ REC 3.579545 MHz 0.45 Vp-p	

JK-172 (LINE 2 IN) PRINTED WIRING BOARD AND SCHEMATIC DIAGRAM

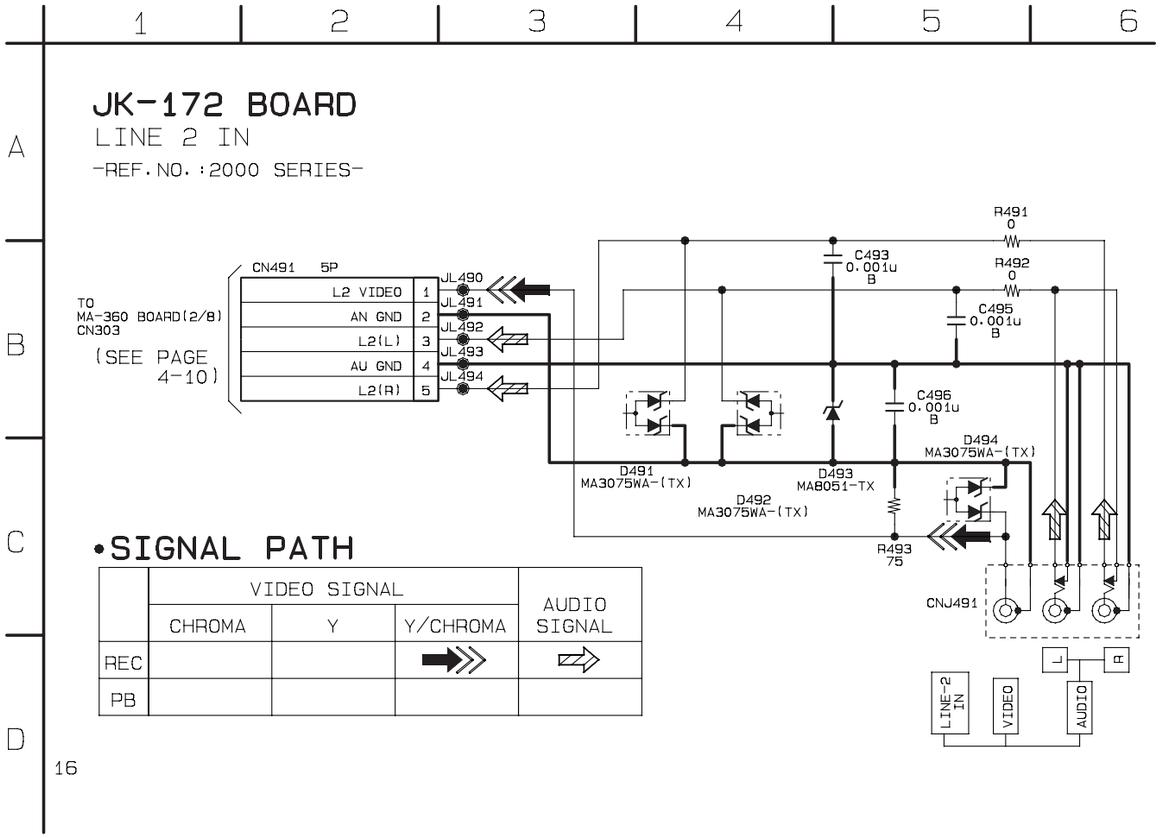
— Ref. No. JK-172 Board; 2,000 Series —





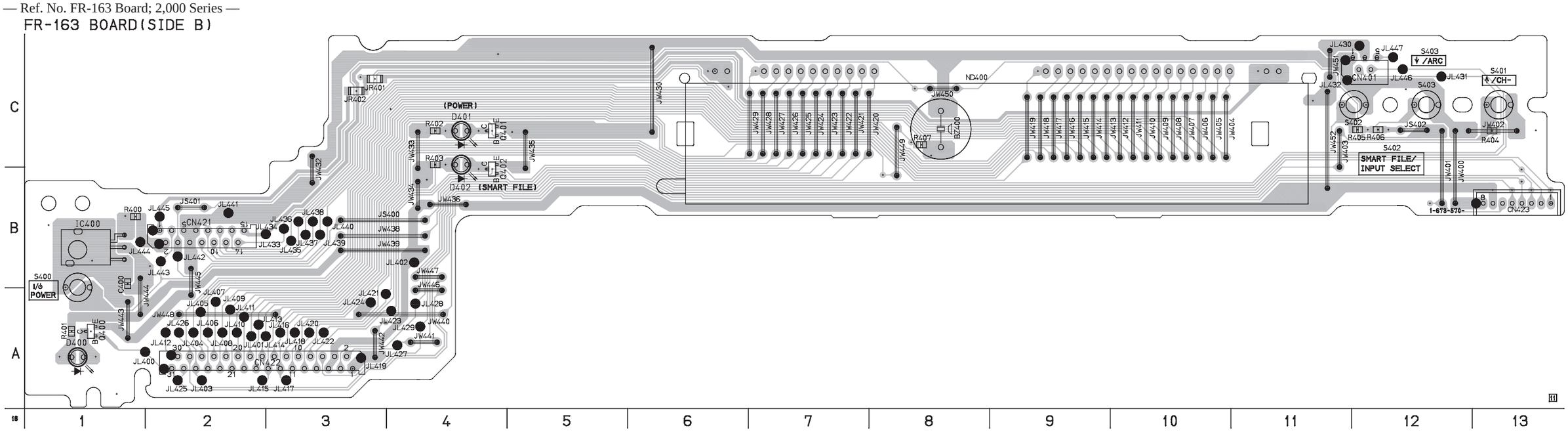
For printed wiring boards

There are few cases that the part printed on this diagram isn't mounted in this model.



FR-163 (INDICATOR) PRINTED WIRING BOARD

— Ref. No. FR-163 Board; 2,000 Series —

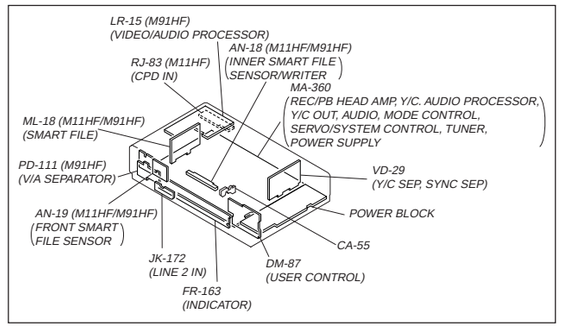


FR-163 BOARD

CN401	C-12
CN421	B-2
CN422	A-2
CN423	
D400	A-1
D401	C-4
D402	B-2
IC400	B-2
Q400	A-1
Q401	C-4
Q402	B-4

For printed wiring boards

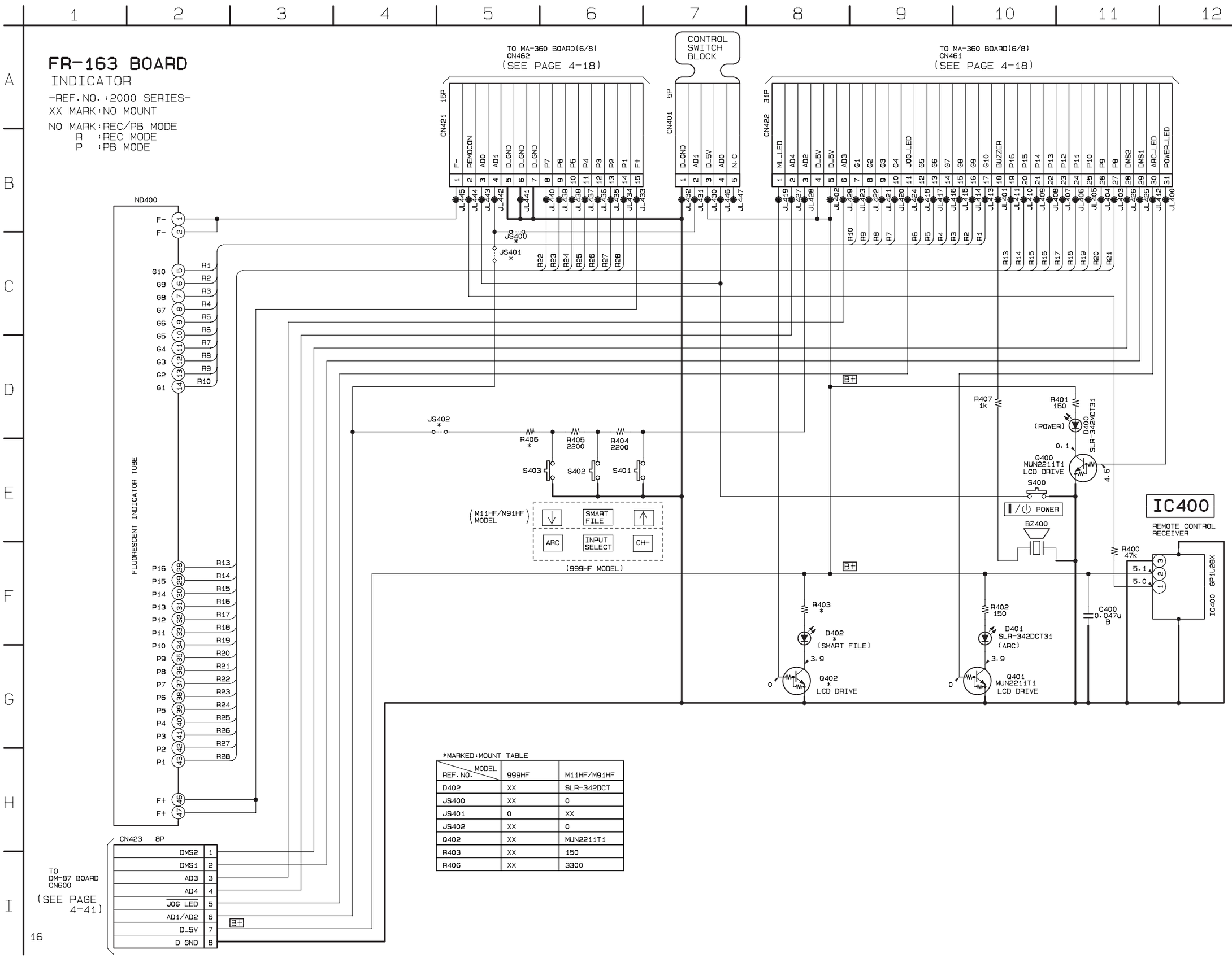
There are few cases that the part printed on this diagram isn't mounted in this model.



FR-163 BOARD

INDICATOR

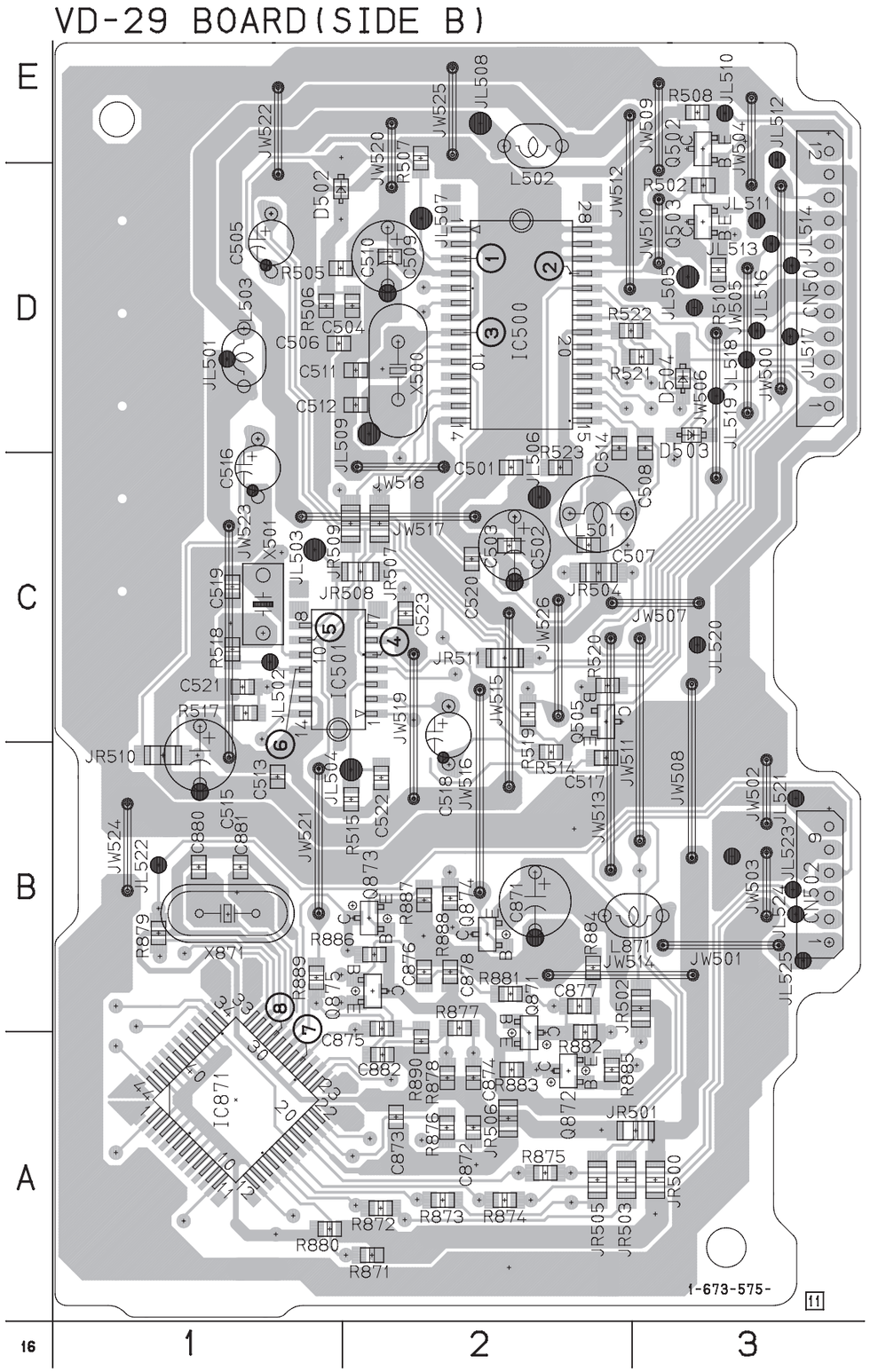
-REF.NO.:2000 SERIES-
XX MARK:NO MOUNT
NO MARK:REC/PB MODE
R :REC MODE
P :PB MODE



*MARKED:MOUNT TABLE

REF.NO. \ MODEL	999HF	M11HF/M91HF
D402	XX	SLR-342DCT
JS400	XX	0
JS401	0	XX
JS402	XX	0
Q402	XX	MUN2211T1
R403	XX	150
R406	XX	3300

VD-29 (Y/C SEP, SYNC SEP) PRINTED WIRING BOARD
— Ref. No. VD-29 Board; 2,000 Series —

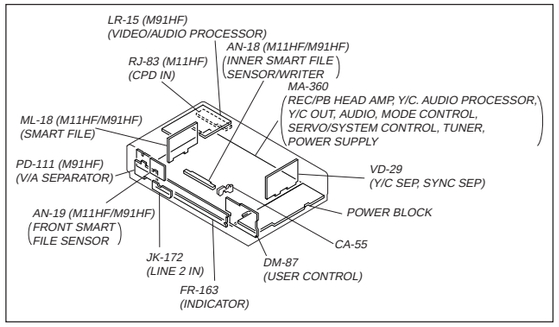


VD-29 BOARD

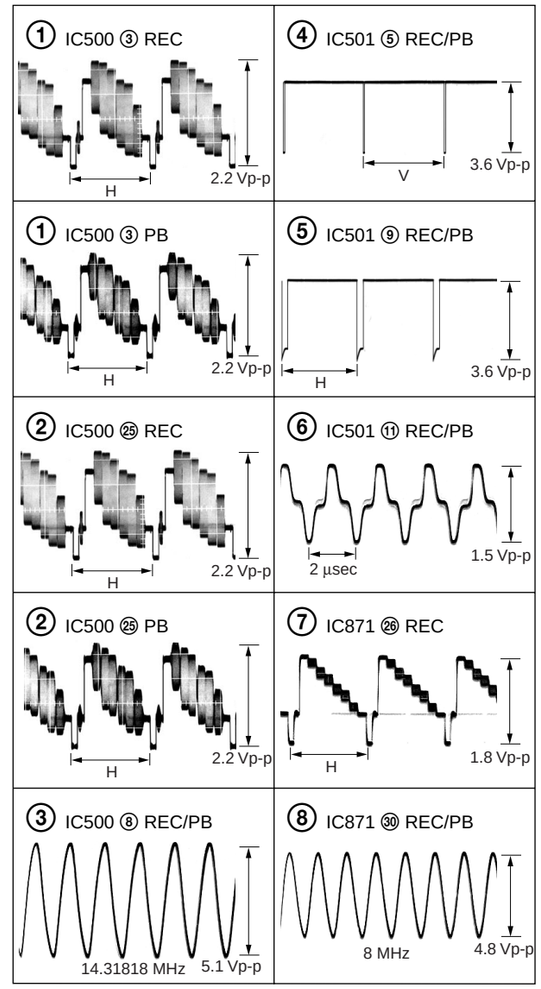
CN501	D-3
CN502	B-3
D502	D-1
D503	D-3
D504	D-3
IC500	D-2
IC501	C-1
IC871	A-1
Q502	D-3
Q503	D-3
Q505	C-3
Q871	A-2
Q872	A-2
Q873	B-2
Q874	B-2
Q875	B-2

For printed wiring boards

There are few cases that the part printed on this diagram isn't mounted in this model.



VD-29 BOARD



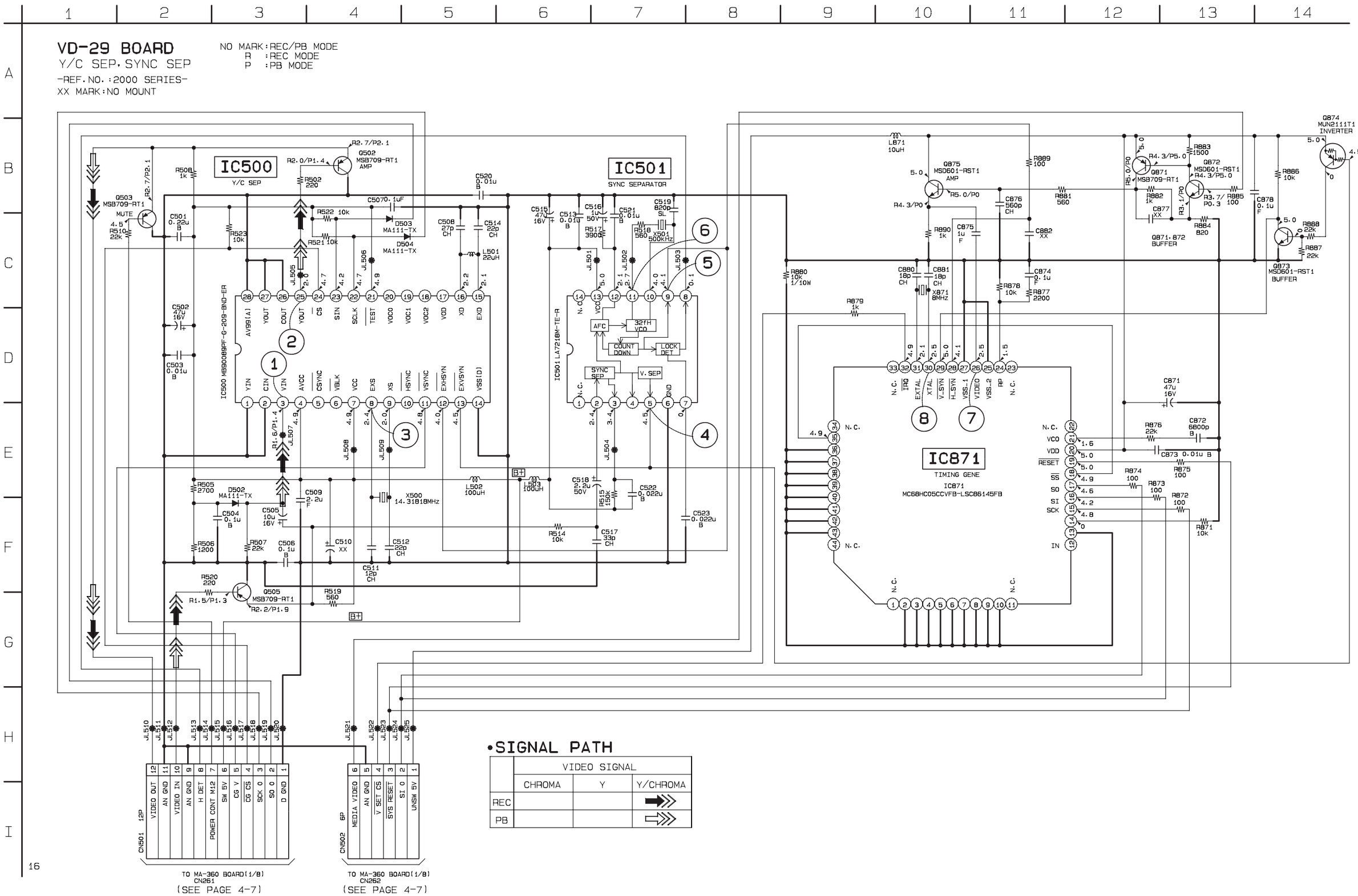
VD-29 BOARD

Y/C SEP, SYNC SEP

-REF.NO.:2000 SERIES-

XX MARK:NO MOUNT

NO MARK:REC/PB MODE
R :REC MODE
P :PB MODE



•SIGNAL PATH

	VIDEO SIGNAL		
	CHROMA	Y	Y/CHROMA
REC			➡
PB			⇨

ML-18 (SMART FILE), AN-18 (INNER SMART FILE SENSOR), AN-19 (FRONT SMART FILE SENSOR), RJ-83 (CPD IN) PRINTED WIRING BOARDS

— Ref. No. ML-18, AN-18 and AN-19 Boards; 2,000 Series, RJ-83 Board; 3,000 Series —

ML-18 BOARD

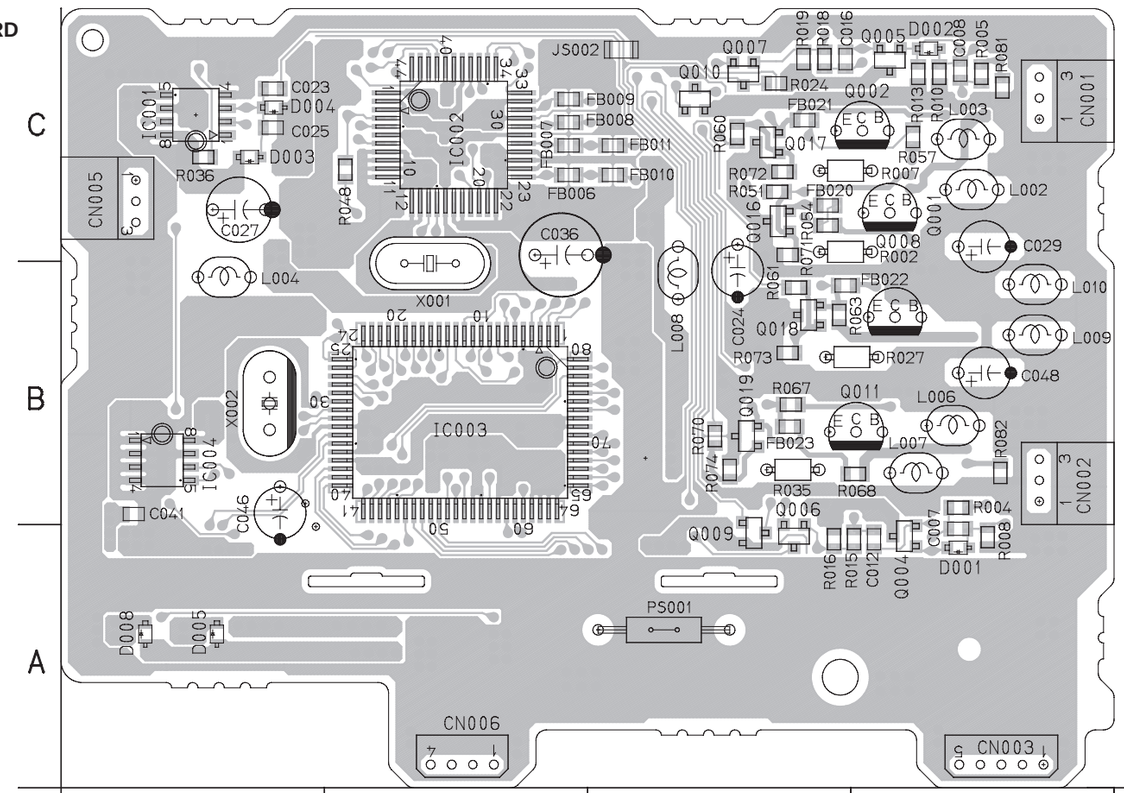
CN001 C-4
CN002 B-4
CN003 A-4
CN005 C-1
CN006 A-2

D001 A-4
D002 C-4
D003 C-1
D004 C-1
D005 A-1
D008 A-1

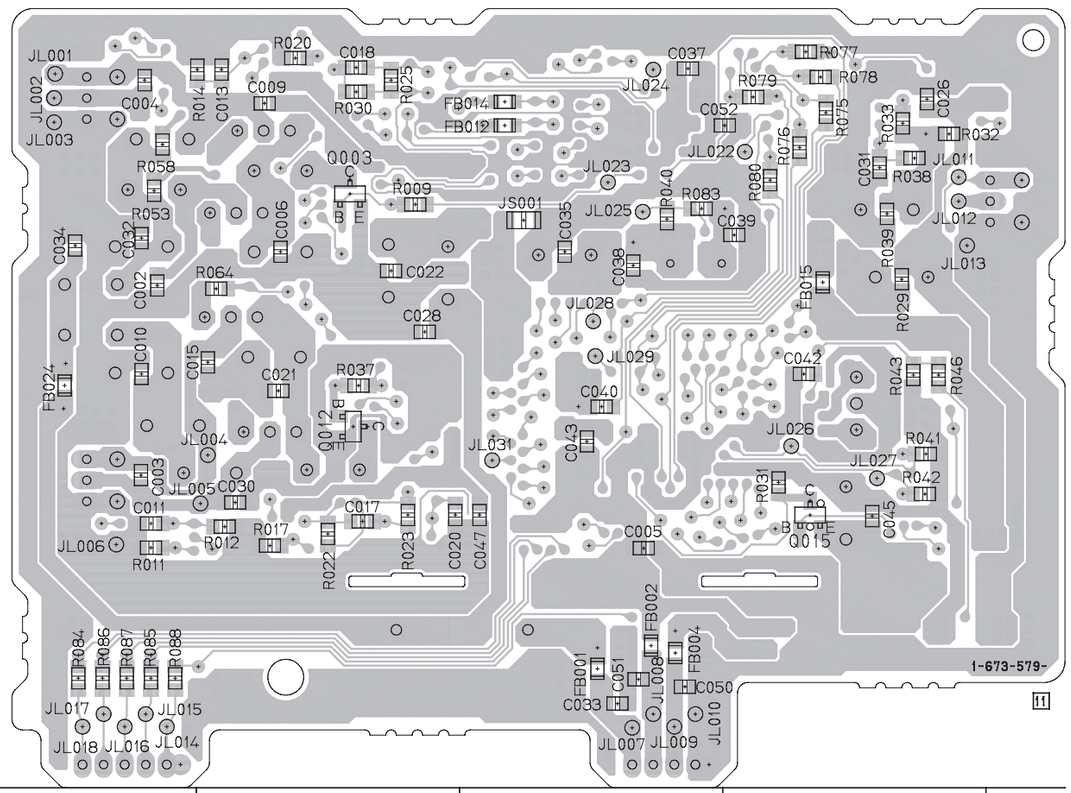
IC001 C-1
IC002 C-2
IC003 B-3
IC004 B-1

Q001 C-4
Q002 C-4
Q003 C-6
Q004 A-4
Q005 C-4
Q006 A-3
Q007 C-3
Q008 B-4
Q009 A-3
Q010 C-3
Q011 B-4
Q012 B-6
Q015 B-8
Q016 C-3
Q017 C-3
Q018 B-3
Q019 B-3

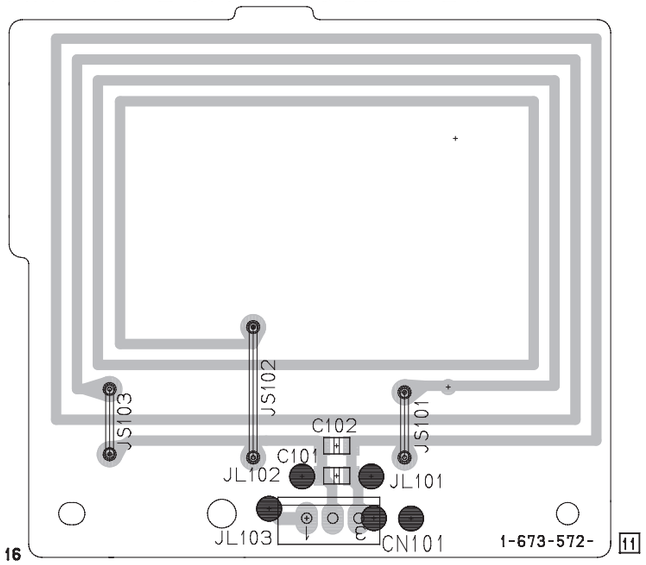
ML-18 BOARD(SIDE A)



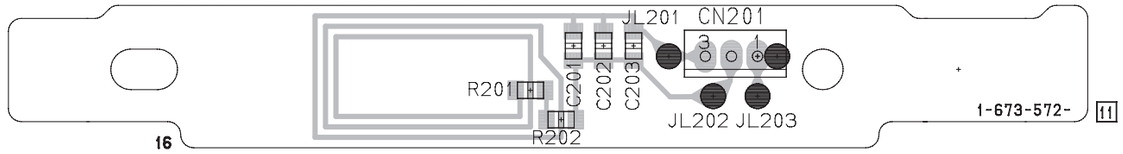
ML-18 BOARD(SIED B)



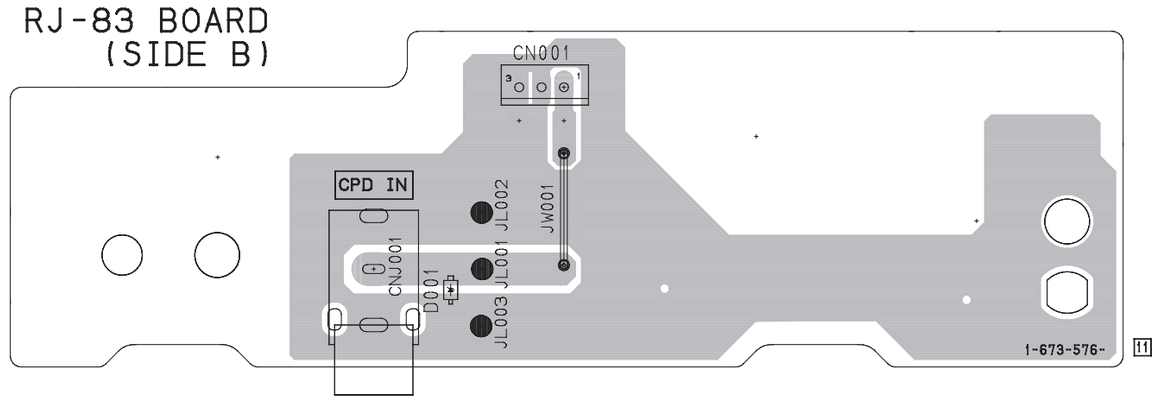
AN-19 BOARD(SIDE B)



AN-18 BOARD(SIDE B)

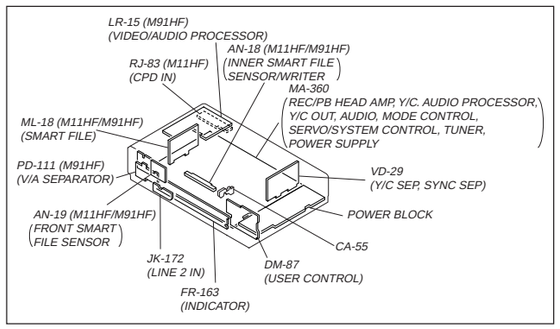


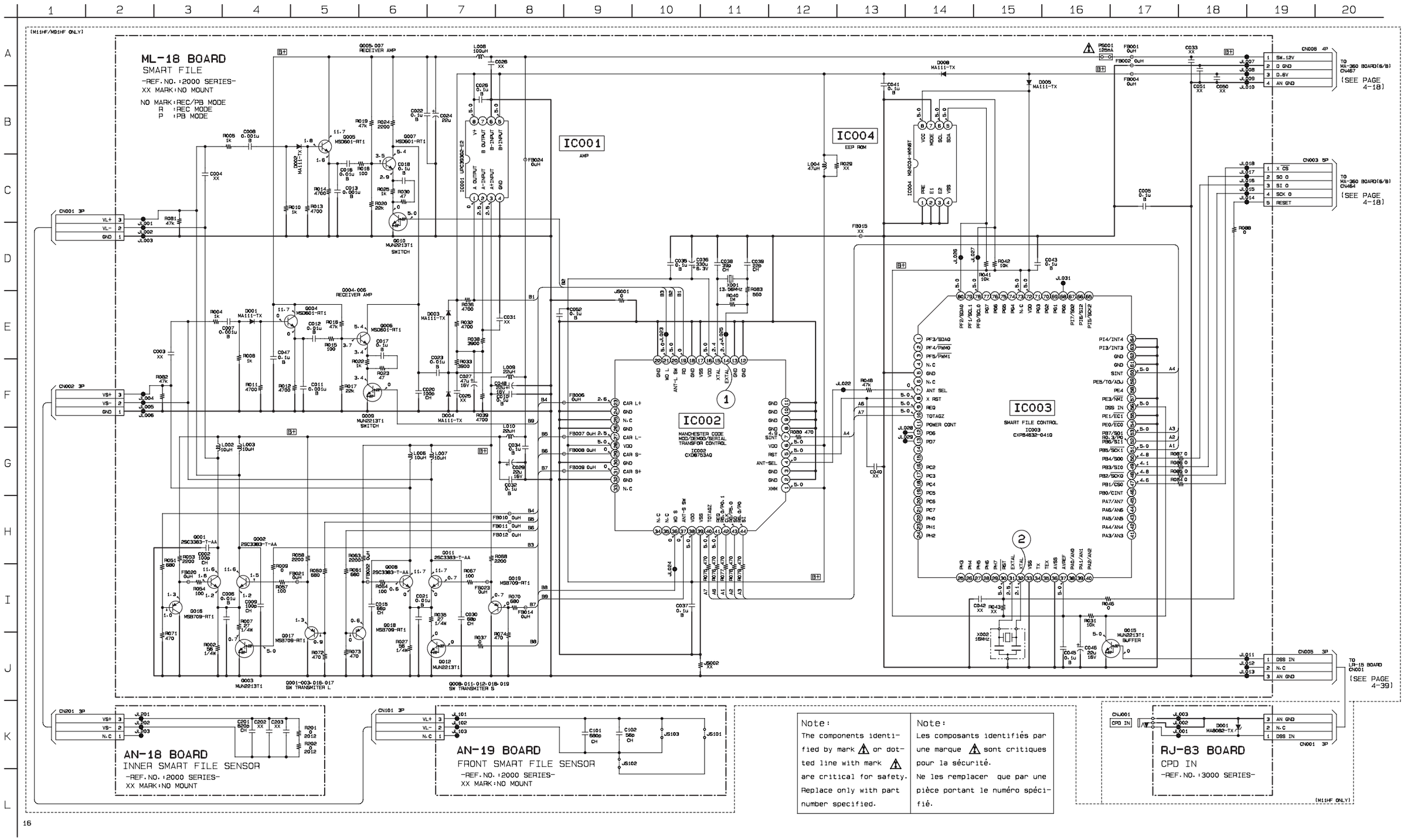
RJ-83 BOARD (SIDE B)



For printed wiring boards

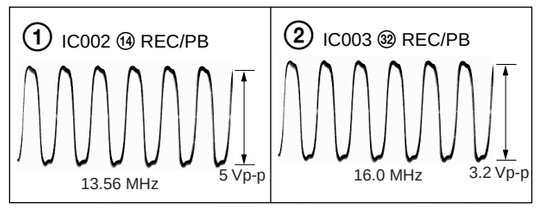
There are few cases that the part printed on this diagram isn't mounted in this model.





Note:	Note:
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.	Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

ML-18 BOARD

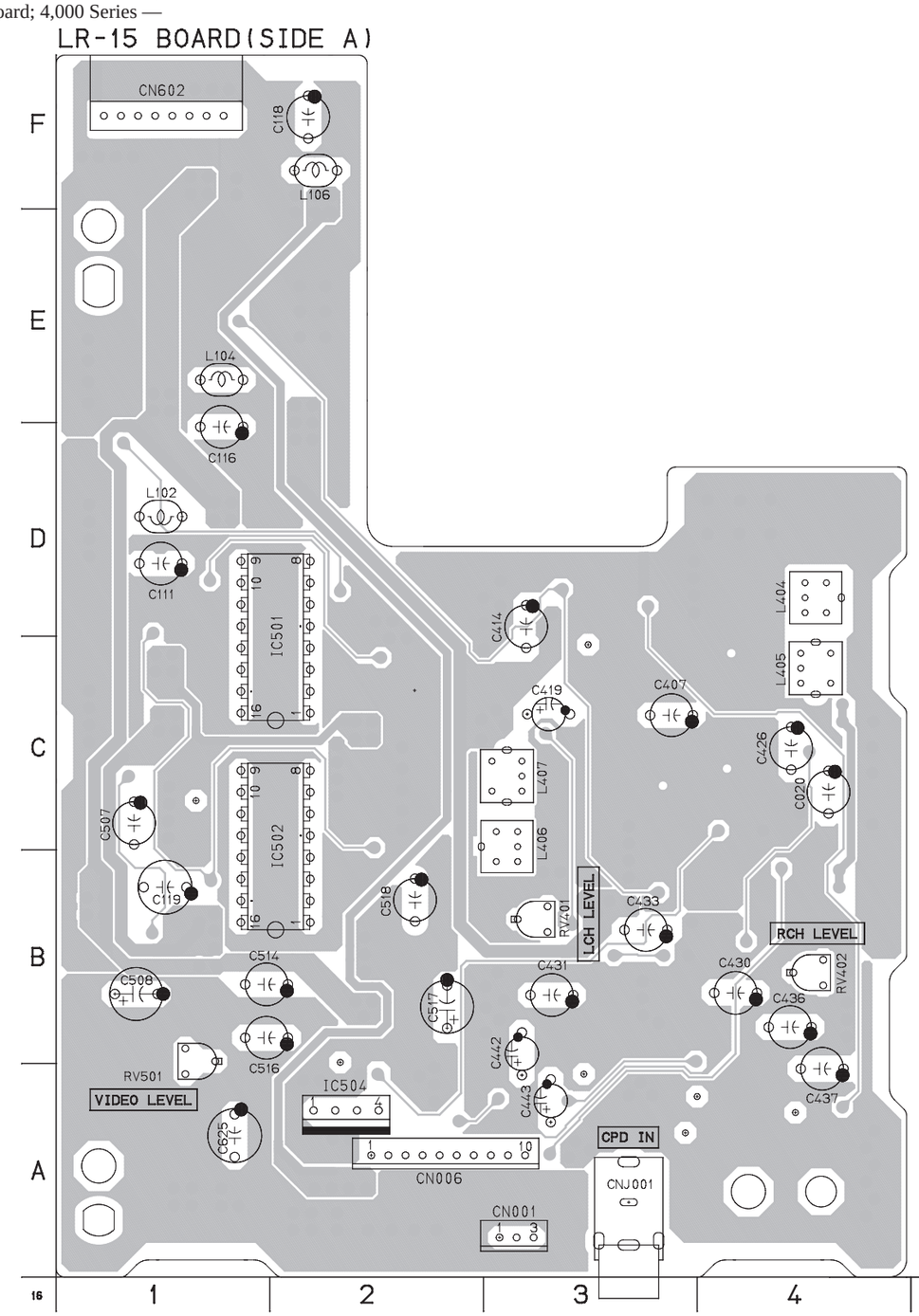


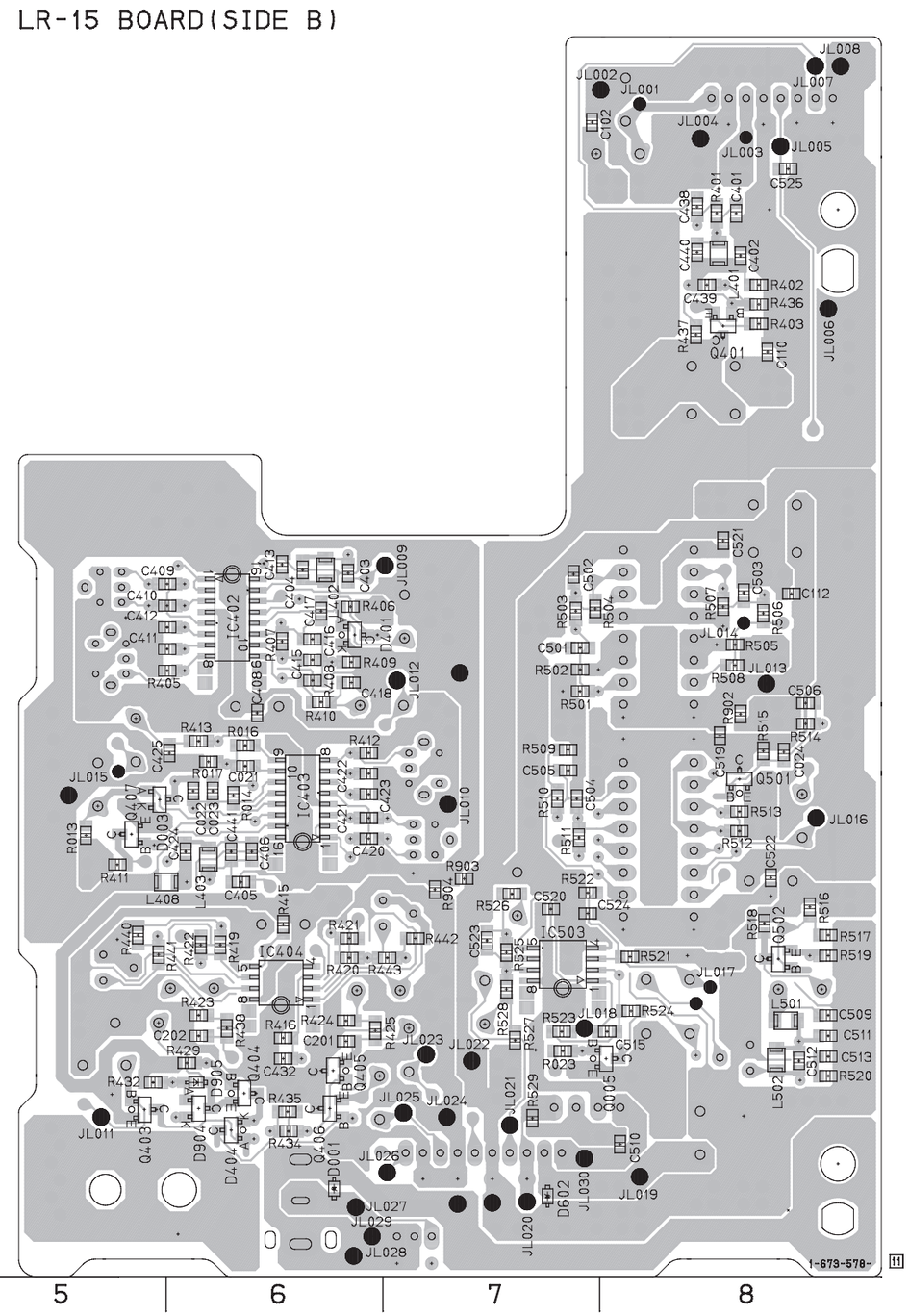
LR-15 (VIDEO/AUDIO PROCESSOR) PRINTED WIRING BOARD

— Ref. No. LR-15 Board; 4,000 Series —

LR-15 BOARD

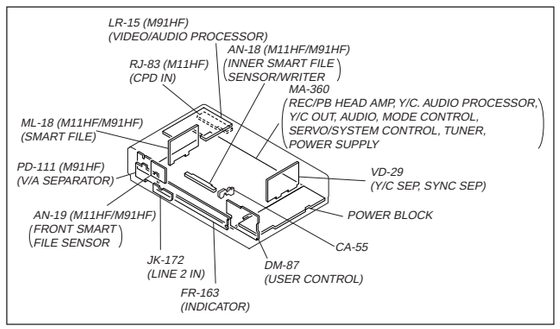
CN001	A-3
CN006	A-2
CN602	F-1
D001	A-6
D003	C-5
D401	C-6
D404	A-6
D602	A-7
D904	A-6
IC402	D-6
IC403	C-6
IC404	B-6
IC501	C-1
IC502	C-1
IC503	B-7
IC504	A-2
Q005	B-8
Q401	E-8
Q403	A-5
Q404	A-6
Q405	A-6
Q406	A-6
Q407	C-5
Q501	C-8
Q502	B-8





For printed wiring boards

There are few cases that the part printed on this diagram isn't mounted in this model.



LR-15 BOARD

VIDEO/AUDIO PROCESSOR

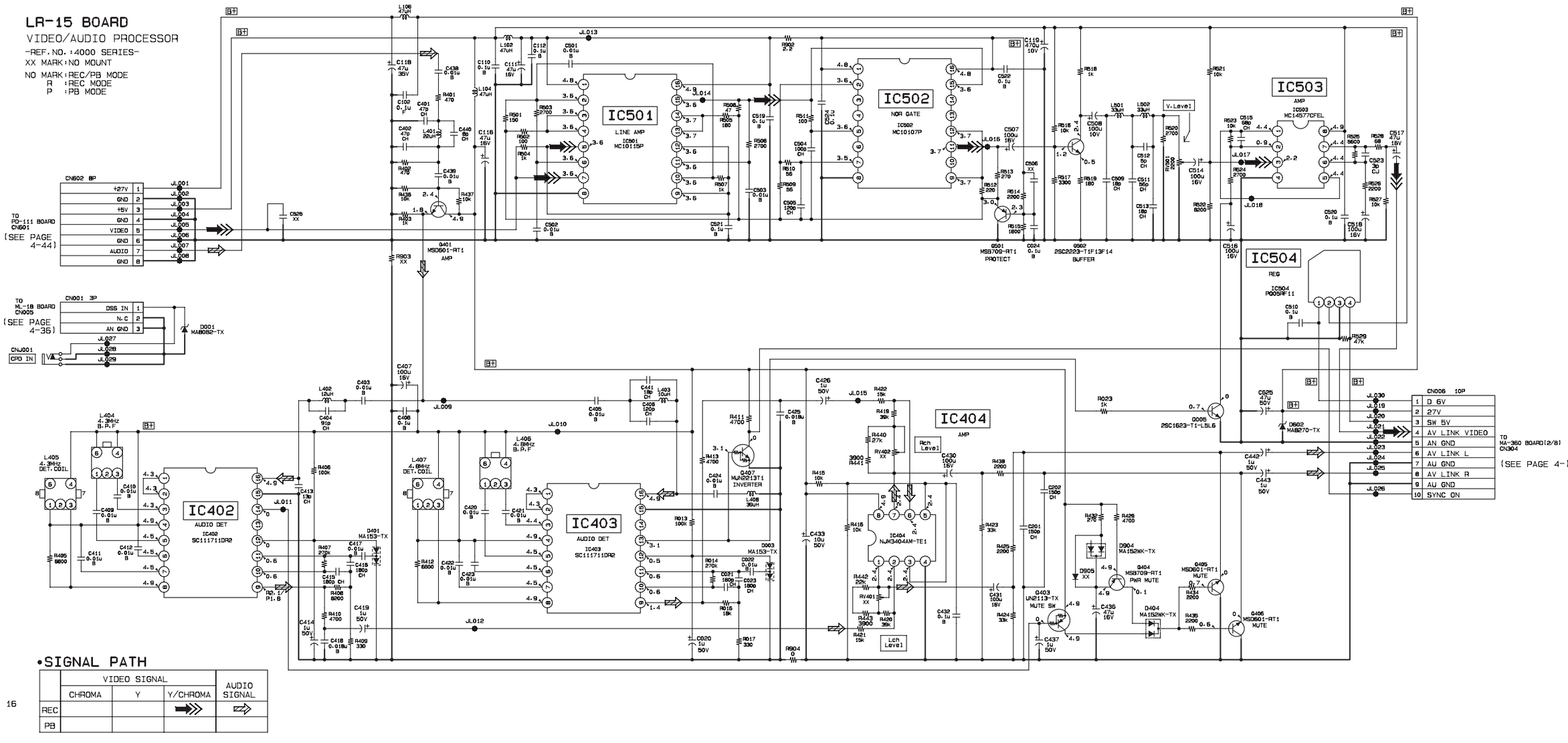
-REF.NO.:4000 SERIES-

XX MARK:NO MOUNT

NO MARK:REC/PB MODE

R :REC MODE

P :PB MODE



•SIGNAL PATH

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC			➡	⇨
PB				

DM-87 (USER CONTROL) PRINTED WIRING BOARD AND SCHEMATIC DIAGRAM

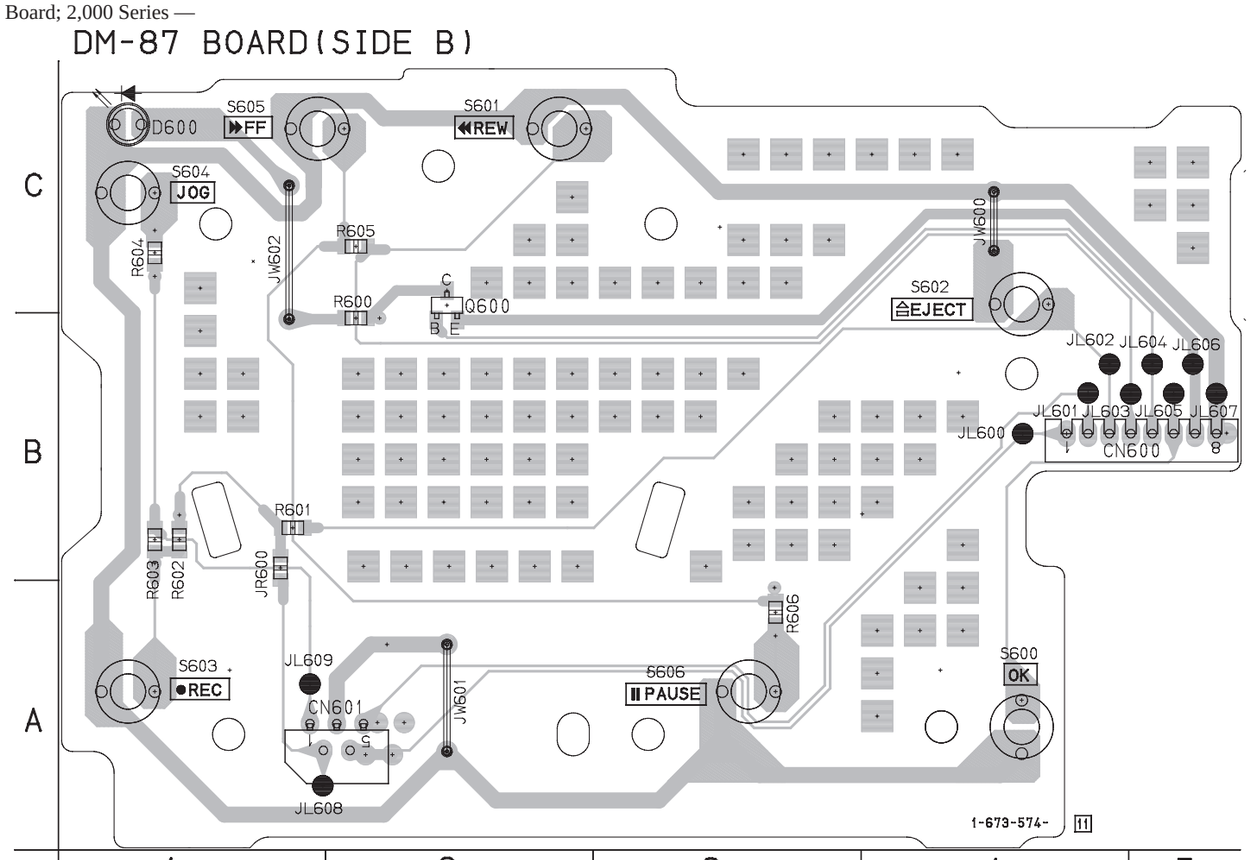
— Ref. No. DM-87 Board; 2,000 Series —

DM-87 BOARD

CN600 B-5
CN601 A-2

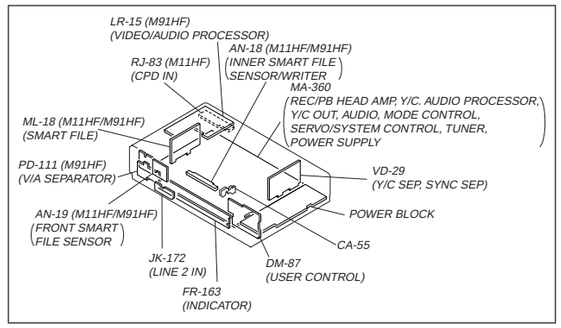
D600 C-1

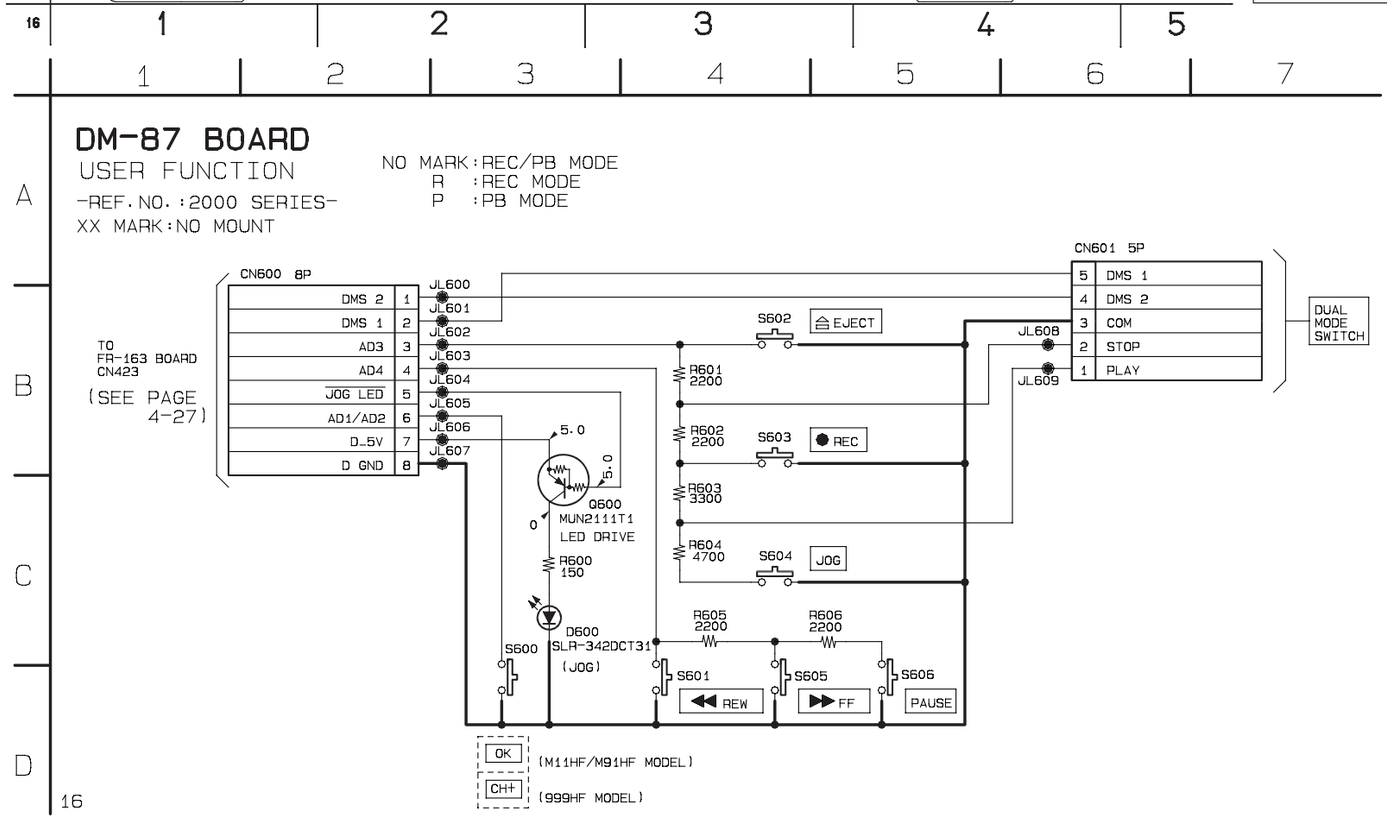
Q600 B-2



For printed wiring boards

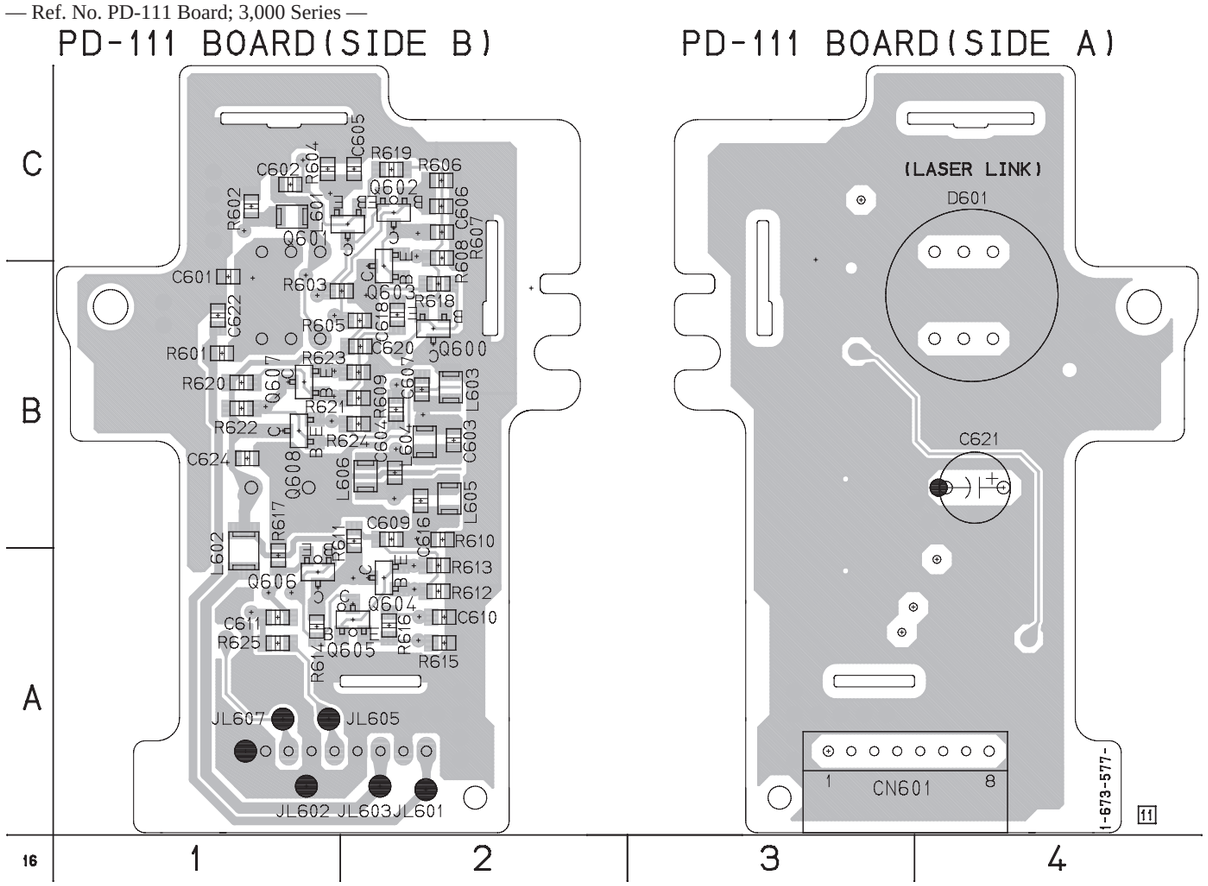
There are few cases that the part printed on this diagram isn't mounted in this model.





PD-111 (V/A SEPARATOR) PRINTED WIRING BOARD AND SCHEMATIC DIAGRAM

— Ref. No. PD-111 Board; 3,000 Series —



PD-111 BOARD

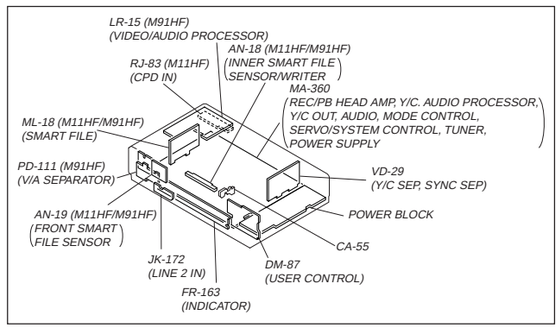
CN601 A-3

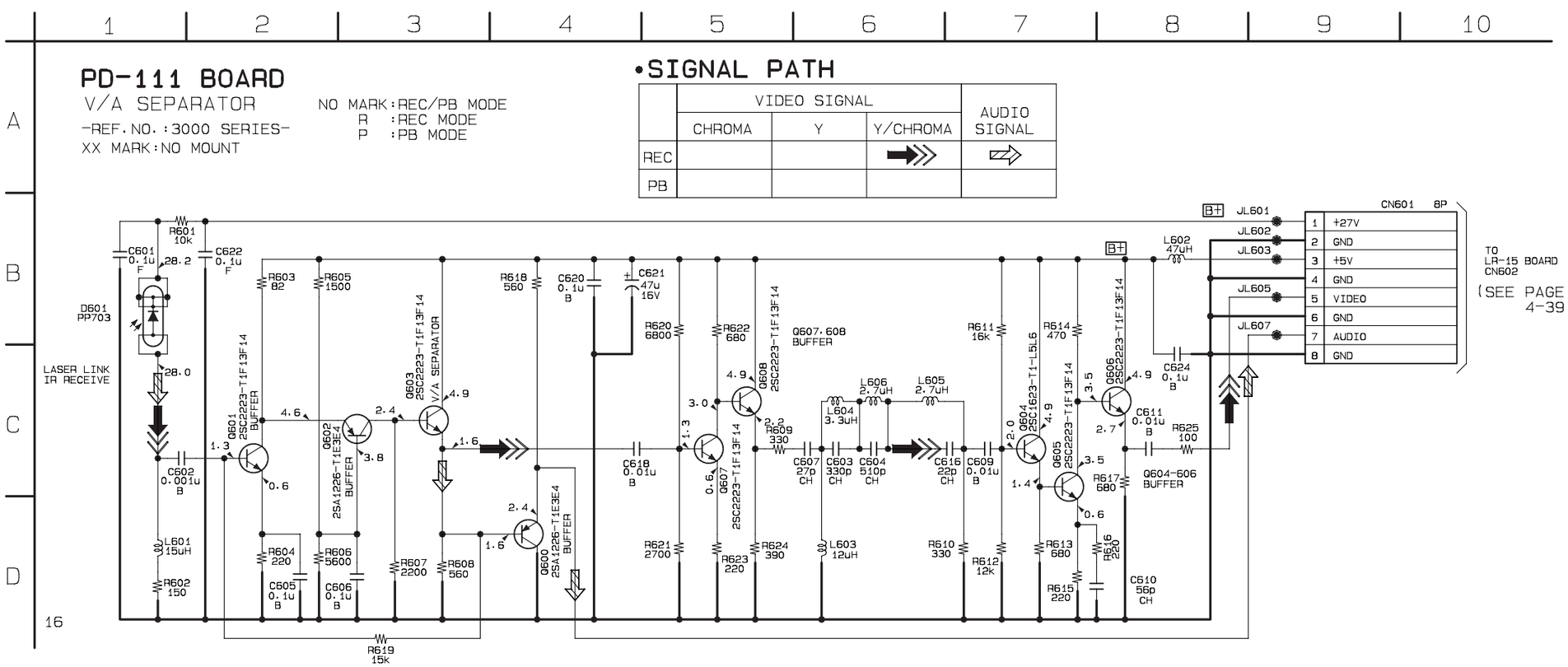
D601 B-4

Q600 B-2
Q601 C-2
Q602 C-2
Q603 B-2
Q604 A-2
Q605 A-2
Q606 A-1
Q607 B-1
Q608 B-1

For printed wiring boards

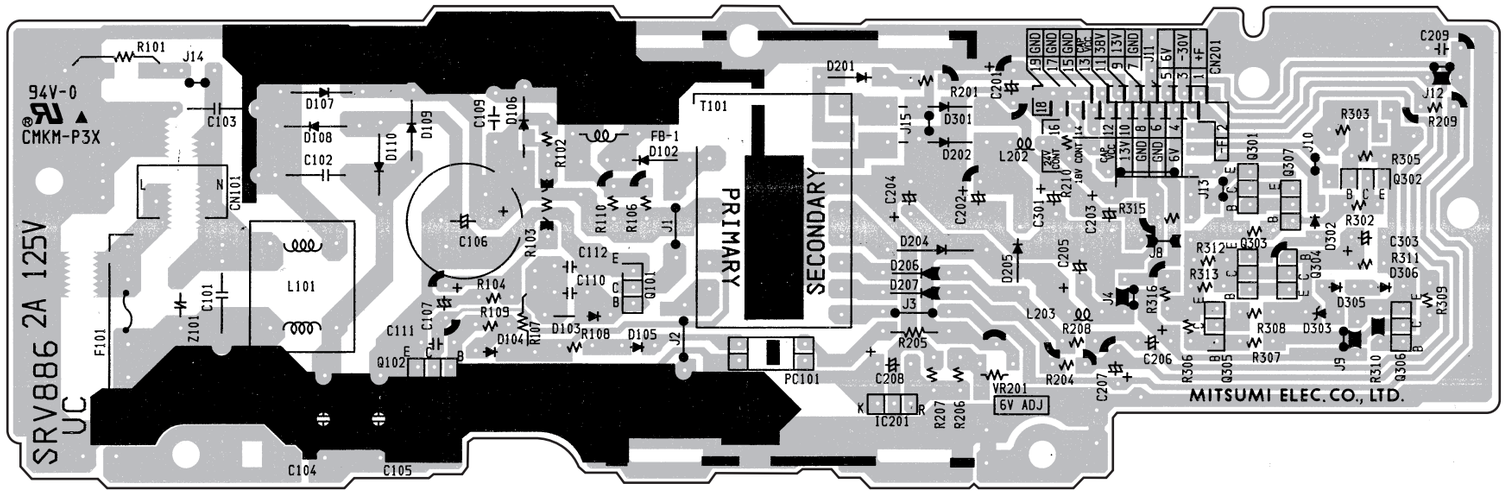
There are few cases that the part printed on this diagram isn't mounted in this model.





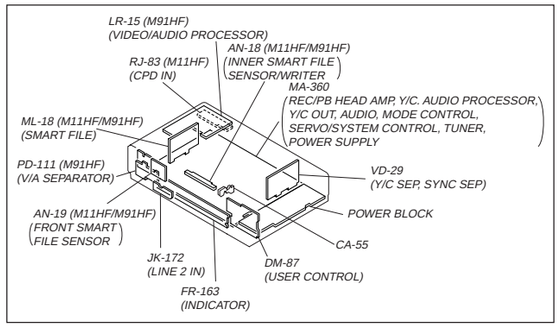
SRV886UC (POWER SUPPLY) PRINTED WIRING BOARD
— Ref. No. SRV886UC Board; 9,000 Series —

SRV886UC (SIDE B)



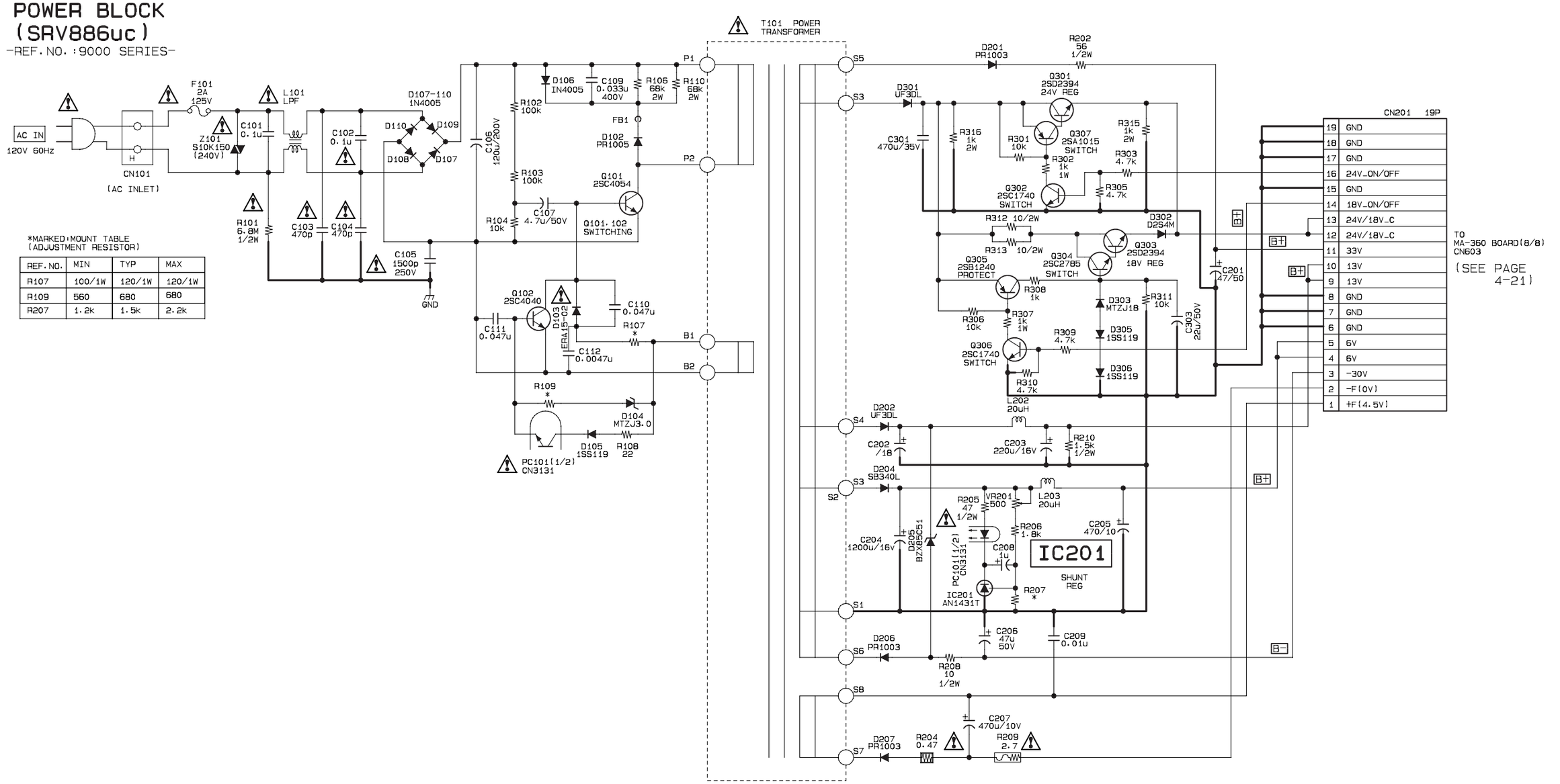
For printed wiring boards

There are few cases that the part printed on this diagram isn't mounted in this model.



POWER BLOCK (SRV886uc)

-REF. NO. :9000 SERIES-



5-1. SYSTEM CONTROL — VIDEO BLOCK INTERFACE (MA-360 BOARD IC161)

Signal	Pin No.	I/O	STOP FF/REW	TAPE THREADING	TAPE UNTHREADING	PB	PB PAUSE	SLOW	x 2	CUE	REVIEW	REC	REC PAUSE
RF SWP	①	O	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1
QVD	④	O	L	L	L	*2	*3	*3	*2	*3	*3	L	L
V SYNC	⑫	I	*4	*5	*5	*5	*5	*5	*5	*5	*5	*5	*5
HA SWP	⑫	O	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1

*1 Synchronized with drum rotation. 30Hz 50% duty cycle.
*2 Normally “L“. “H“ when CTL signal is not generated.
*3 V period “H“ pulse.
*4 Selected by REC mode. “H“ in LP mode.“
*5 Composite sync signal (positive).

5-2. SYSTEM CONTROL — SERVO PERIPHERAL CIRCUIT INTERFACE (MA-360 BOARD IC161)

Signal	Pin No.	I/O	STOP	FF	REW	TAPE THREADING	TAPE UNTHREADING	PB	PB PAUSE	SLOW	CUE	x 2	REVIEW	REC	REC PAUSE
$\overline{\text{CAP STOP}}$	㉝	O (O.D)	L	Hi-Z (O.D)	Hi-Z (O.D)	Hi-Z (O.D)	Hi-Z (O.D)	Hi-Z (O.D)	L	*3	Hi-Z (O.D)	Hi-Z (O.D)	Hi-Z (O.D)	Hi-Z (O.D)	Hi-Z (O.D)
STEP PLS	㊾	O	L	L	L	L	L	L	L	*2	L	L	L	L	L
DRM PG	㊺	I	*4	*1	*1	*5	*5	*1	*1	*1	*1	*1	*1	*1	*1
DRM FG	㊻	I	*4	*7	*7	*5	*5	*7	*7	*7	*7	*7	*7	*7	*7
CAP FG	㊼	I	H/L	*6	*6	*5	*5	*6	H/L	*2	*6	*6	*6	*6	H/L
CAP DA	㊽	O	*8	*8	*8	*8	*8	*9	*8	*8	*9	*8	*9	*9	*8
DRM DA	㊾	O	*10	*10	*10	*10	*10	*10	*10	*10	*10	*10	*10	*10	*10

*1. 30Hz pulse.
*2. Pulse at tape running.
*3. Reverse logic pulse of STEP PLS.
*4. “L” when drum rotation stops.
*5. Unstable period pulse.
*6. Pulse in period in proportional to tape speed.
*7. 360Hz pulse.
*8. Pulse at tape running.
*9. Approx. 2 msec period “H” or “L” pulse.
*10. Approx. 1.5 msec period “H” or “L” pulse.
*11. “L” when FWD SLOW, “H” when RVS SLOW.

5-3. SYSTEM CONTROL — MECHANISM INTERFACE (MA-360 BOARD IC161)

Signal	Pin No.	I/O	EJECTED	CASSETTE LOADING	CASSETTE UNLOADING	TAPE THREADING	TAPE UNTHREADING	STOP	FF	REW	PB	PB PAUSE	SLOW	x 2	CUE	REVIEW	REC	REC PAUSE
CAM2	⑨	HI-Z	L	H	L	H	L	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7
MODE 1 (*8)	㉑	I	H	L	L	*1	*1	H	H	H	H	H	H	H	H	L	H	H
MODE 2 (*8)	⑳	I	H	L	L	*1	*1	H	H	H	L	L	L	L	L	L	L	L
MODE 3 (*8)	⑲	I	L	L	L	*1	*1	H	L	L	L	L	L	L	L	H	L	L
MODE 4 (*8)	⑱	I	L	H	H	*1	*1	L	H	H	H	L	L	L	L	L	L	L
(IN REC PRF)	⑮	I	H	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2
T REEL FG	⑰	I	H/L	H/L	H/L	H/L	H/L	H/L	*3	*3	*3	H/L	*3	*3	*3	*3	*3	H/L
S REEL FG	⑯	I	H/L	H/L	H/L	*3	*3	H/L	*3	*3	*3	H/L	*3	*3	*3	*3	*3	H/L
T/E LED	㉜	O (O.D)	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4
$\overline{\text{CAP STOP}}$	㉝	O (O.D)	L	L	L	H	H	L	H	H	H	L	*5	H	H	H	H	L
CAP RVS	㉚	O	H			L	H	H/L	L	H	L	L	L/*5	L	L	H	L	L
T SENS	㉛	I	*4	*4	*4	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6
S SENS	㉜	I	*4	*4	*4	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6

*1. Uncertainly.
*2. “L” when erasing protection tab is bent. “H” when not bent.
*3. Pause of period in proportion to reel rotating speed.
*4. Approx. 2 msec period “H” pulse.
*5. Pulse at tape running.
*6. Normally “L”. 2 msec period “H” pulse when tape top or tape end is detected.
*7. When transition to UNLOADING direction : “L”.
When transition to LOADING direction : “H”.
When CAM MOTOR is stopped : Hi-Z.
*8. When RVS slow : Mode 1=”L”
When RVS slow : Mode 2=”L”
When RVS slow : Mode 3=”H”
When RVS slow : Mode 4=”L”

5-4. SYSTEM CONTROL — SYSTEM CONTROL PERIPHERAL CIRCUIT INTERFACE (MA-360 BOARD IC161)

Signal	Pin No.	I/O	I/O Level
$\overline{\text{ASURA RESET}}$	㊵	I	Normally “H”, “L” when service interruption is detected or restored.
$\overline{\text{ASURA CS}}$	㉖	I	Chip select signal from timer microprocessor. V period “L” pulse.
S IN 0	㉓	I	Serial communication data from timer microprocessor. V period “ L” pulse.
S OUT 0	㉔	O	Serial communication data to timer microprocessor. V period “L” pulse.
$\overline{\text{S CLK}}$	㉕	I	Serial communication clock from timer microprocessor. V period “L” pulse.

5-5. SYSTEM CONTROL — AUDIO BLOCK INTERFACE (MA-360 BOARD IC161)

Signal	Pin No.	I/O	STOP/FF/ REW	TAPE LOADING	TAPE UNLOADING	PB	PB PAUSE	SLOW	x 2	CUE	REVIEW	REC	REC PAUSE
AF ENV	㊾	I	AF RF envelope signal input terminal for automatic tracking.										
A MUTE	㉛	O (O.D)	L	L	L	*1	H	H	H	H	H	L	L
AF REC $\overline{\text{P}}$	②	O	L	L	L	L	L	L	L	L	L	H	L
AF SWP	⑱	O	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1
$\overline{\text{FULL ERS}}$	㉞	O (O.D)	H	H	H	H	H	H	H	H	H	L	H

*1. 30 Hz 50 % duty pulse approx. 5 msec delayed from RF SW P.

5-6. SERVO/SYSTEM CONTROL MICROPROCESSOR PIN FUNCTIONS (MA-360 BOARD IC161)

Pin No.	Pin Name	I/O	Function
1	RF SWP	O	RF switching pulse output.
2	AF REC $\overline{P}$	O	"H" when HiFi audio REC.
3	AF REC	O	"H" output when HiFi audio recording.
4	QVD	O	Quasi VD pulse output.
5	AUTO PRESET	O	"H" during auto preset.
6	FE ON	O	Flying erase ON/OFF.
7	N.C		Not used.
8	L.LINK	O	Laser Link control out.
9	CAM 2	I	Cam motor control.
10	N.C		Not used.
11	TA MUTE	O	Tuner audio mute. H: Mute
12	N.C		Not used.
13	N.C		Not used.
14	N.C		Not used.
15	CIN (REC PRF)	I	Erasing protection tab, cassette in detection signal input.
16	AV CONT		Not used.
17	N.C		Not used.
18	MODE 4	I	Cam encoder signal input.
19	MODE 3	I	Cam encoder signal input.
20	MODE 2	I	Cam encoder signal input.
21	MODE 1	I	Cam encoder signal input.
22	ENV SW	I	Video envelope mode detect signal (SP or EP)
23	S IN 0	I	Serial communication signal.
24	S OUT 0	O	Serial communication signal.
25	$\overline{\text{S CLK}}$	I	Serial communication signal.
26	$\overline{\text{ASURA CS}}$	I	Servo/system control microcomputer chip select signal.
27	SERVO	O	Not used.
28	CAP TRQ PWM	O	PWM output for capstan torque control.
29	N.C		Not used.
30	$\overline{\text{CAP RVS}}$	O	Capstan reverse control "L" when reverse.
31	A MUTE	O	"H" when audio mute.
32	T/E LED	O	Tape top /end sensors driver.
33	$\overline{\text{CAP STOP}}$	O	Capstan stop signal output.
34	$\overline{\text{FULL ERS}}$	O	Full erase control.
35	N.C		Not used.
36	I2C DATA	I/O	Serial communication data.
37	N.C		Not used.
38	I2C CLOCK	I/O	Serial communication clock.
39	MP	—	Ground.
40	$\overline{\text{ASURA RESET}}$	I	System reset signal.
41	GND	—	Ground.
42	XTAL	O	System clock (16 MHz).
43	EXTAL	I	System clock (16 MHz).
44	N.C	—	Ground.
45	DRUM PG	I	Drum PG input.
46	DRUM FG	I	Drum FG input.
47	CAP FG	I	Capstan FG input.
48	NICOL ON	O	NICOL control signal out.
49	CBC POWER	O	Cable box control signal out.
50	F MONO	O	Forced mono.

Pin No.	Pin Name	I/O	Function
51	SW2	O	Not used.
52	GND	—	Ground.
53	VDD	I	UNSW 5 V.
54	VDD	I	UNSW 5 V.
55	N.C	—	Ground.
56	AV ADJ	I	Adjustment mode.
57	N.C	—	Ground.
58	N.C	—	Ground.
59	AF ENV	I	HiFi audio playback signal envelope.
60	RF ENV	I	Video playback signal envelope.
61	T SENS	I	Take-up end sensor.
62	S SENS	I	Supply end sensor.
63	VDD	I	UNSW 5 V.
64	AMP VSS	—	Ground.
65	CTL HEAD (Y)	I/O	CTL signal I/O.
66	CTL HEAD (X)	I/O	CTL signal I/O.
67	HEADL (+)	O	CTL signal.
68	HEADL (–)	O	CTL signal.
69	CTL FAMPI (+)	I	CTL first AMP input.
70	CTL FAMPI (–)	I	CTL first AMP input.
71	CTL AGND	O	Ground.
72	CTL SAMPI	I	CTL second AMP input.
73	CTL FAMPO	O	CTL first AMP output.
74	AMP VDD	I	5 V.
75	ANOUT	O	Control signal output for check pin.
76	S REEL FG	I	Supply reel FG input.
77	T REEL FG	I	Take-up reel FG input.
78	CAP DA	O	Capstan error D/A output.
79	DRM DA	O	Drum error D/A output.
80	N.C		UNSW 5 V.
81	N.C	—	Ground.
82	VSYNC	I	Composite sync signal input.
83	N.C		Not used.
84	18 V_CONT	O	18 V control, when the high speed mode.
85	24 V_CONT	O	24 V control, when the high speed mode.
86	TEX		Not used.
87	TX		Not used.
88	VSS	—	Ground.
89	VDD	I	UNSW 5 V.
90	VDD	I	UNSW 5 V.
91	$\overline{\text{FAST SEARCH}}$	O	CTL level control signal "L" when high speed mode.
92	HA SWP	O	Video head switching pulse signal output.
93	C ROT	O	Color rotate pulse signal output.
94	POWER SAVE CONT	O	Not used.
95	POWER SAVE C+	O	Not used.
96	MOD CONT	O	Not used.
97	$\overline{\text{SP}}$	O	Tape speed mode control signal "L" when SP mode.
98	$\overline{\text{TV}}$/VTR	O	$\overline{\text{TV}}$/VTR control signal output.
99	STEP PLS	O	Step pulse "H" when capstan step driving.
100	AF SWP	O	AF switching pulse output.

5-7. TUNER/TIMER CONTROL MICROPROCESSOR PIN FUNCTIONS (MA-360 BOARD IC460)

Pin No.	Pin Name	I/O	Function
1	SYNC ON	O	During Laser Link signal resived “H”.
2	$\overline{\text{POWER FAIL}}$	I	Power failure detect signal input.
3	H DET	I	H DET_(Tuner Hsync detect input).
4	SIRCS IN	I	Remote control signal input.
5	STEREO DET	I	Stereo judge input.
6	SW1 SIRCS OUT	O	Remote control signal output.
7	BUZZER	O	Buzzer signal output.
8	N.C		Not used.
9	ARC_LED	O	ARC led control “H” when ARC on.
10	SCK 0	I	Serial communication signal (clock).
11	SI 0	I	Serial communication signal (data in).
12	SO 0	O	Serial communication signal (data out).
13	$\overline{\text{EEP WP}}$	O	EEP mode control.
14	LANC IN	I	LANC input.
15	LANC OUT	O	LANC output.
16	A/D 0	I	Analog voltage (key) input.
17	A/D 1	I	Analog voltage (key) input.
18	A/D 2	I	Analog voltage (key) Input.
19	A/D 3	I	Analog voltage (key) Input.
20	A/D 4	I	Analog voltage (key) Input.
21	ML LED	O	ML LED ON/OFF control.
22	X $\overline{\text{CS}}$	O	Memory label board chip select signal out.
23	AFT	I	Auto fine tuning signal input.
24	AVDD	I	A/D port reference input.
25	AV REF		UNSW 5 V.
26	SCL 0	O	T BUS (clock) /IIC BUS (clock).
27	CG CS	O	Character generator chip select signal.
28	SDA 0	O	IIC BUS (data).
29	JOG LED	O	JOG LED control signal output.
30	AVSS	I	Ground.
31	EXTAL		System clock terminal (16 MHz).
32	XTAL		System clock terminal (16 MHz).
33	VSS	I	Ground.
34	$\overline{\text{RST}}$	I	RESET input.
35	PLL CLK	O	TUNER PLL clock.
36	PLL DATA	O	TUNER PLL data.
37	PLL ENABLE	O	TUNER chip select.
38	MAIN/$\overline{\text{SAP}}$	O	Main/SAP judge signal output.
39	$\overline{\text{SAP}}$ DET	I	Main/SAP judge signal input.
40	$\overline{\text{V SET CS}}$	O	Vset IC chip select signal.
41	DMS 1	I	DMS forward/reverse signal input.
42	DMS 2	I	DMS forward/reverse signal input.
43	VFDP	I	VFDP.
44	SEG1	O	Segment terminal 1
45	SEG2	O	Segment terminal 2
46	SEG3	O	Segment terminal 3
47	SEG4	O	Segment terminal 4
48	SEG5	O	Segment terminal 5
49	SEG6	O	Segment terminal 6
50	SEG7	O	Segment terminal 7

Pin No.	Pin Name	I/O	Function
51	SEG8	O	Segment terminal 8.
52	SEG9	O	Segment terminal 9.
53	SEG10	O	Segment terminal 10.
54	SEG11	O	Segment terminal 11.
55	SEG12	O	Segment terminal 12.
56	SEG13	O	Segment terminal 13.
57	SEG14	O	Segment terminal 14.
58	SEG15	O	Segment terminal 15.
59	SEG16	O	Segment terminal 16.
60	N.C		Not used.
61	N.C		Not used.
62	GRID10	O	Grid terminal 10.
63	GRID9	O	Grid terminal 9.
64	GRID8	O	Grid terminal 8.
65	GRID7	O	Grid terminal 7.
66	GRID6	O	Grid terminal 6.
67	GRID5	O	Grid terminal 5.
68	GRID4	O	Grid terminal 4.
69	GRID3	O	Grid terminal 3.
70	GRID2	O	Grid terminal 2.
71	GRID1	O	Grid terminal 1.
72	VDD	I	D5 V
73	TX		Timer clock terminal (32.768 kHz).
74	TEX		Timer clock terminal (32.768 kHz).
75	NC/VCC	O	D5 V
76	ASURA CS	O	S/S microcomputer chip select signal.
77	$\overline{\text{SYS RESET}}$	O	System reset output.
78	POWER CONT M12	O	Power supply control signal.
79	POWER CONT SW12	O	Power supply control signal.
80	CG V	I	Composite sync input.

SECTION 6
ADJUSTMENTS

6-1. MECHANICAL ADJUSTMENT

For the mechanical adjustments, please refer to the "VHS MECHANICAL ADJUSTMENT MANUAL Ⅵ S MECHANISM " (9-921-647-11).

6-2. ELECTRICAL ADJUSTMENT

See the adjusting part location diagram from on page 6-8 for the adjustment.

2-1. PREPARATION BEFORE ADJUSTMENT

2-1-1. Equipment Required

The measuring instruments used for this alignment include:

1) Monitor TV
2) Oscilloscope, dual-trace, bandwidth above 30 MHz with delay mode (Unless specified otherwise, use a 10 : 1 probe.)
3) Frequency counter
4) NTSC pattern generator
5) Remote commander
5) Digital voltmeter
6) Audio generator
7) Audio level meter
8) Audio distortion meter
9) Audio attenuator
10) Alignment tape
    KRV-51N2 (NTSC) Part No.: 8-192-605-32
11) Camcoder with LASER LINK function

2-1-2. Equipment Connection

Unless specified otherwise, connect the measuring instrument as shown in the following diagram.

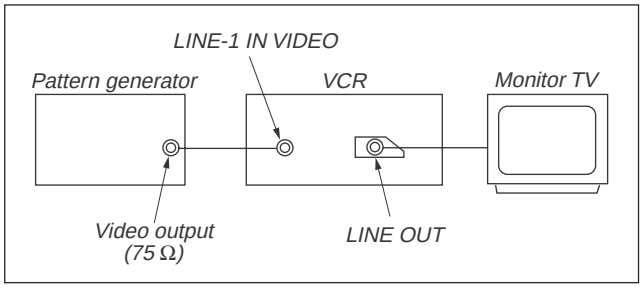


Fig. 6-2-1

2-1-3. Setup for adjustment

Because the video signal obtained from the pattern generator is used as the adjustment signal for adjustments, the video output signal must satisfy the given specification.

Connect the oscilloscope to VIDEO LINE-1 IN terminal, and check that the amplitude of sync signal is approximately 0.286 V, the amplitude of the video section is approximately 0.714 V and the amplitude of burst signal is approximately 0.286 V.

The video signal used for adjustments is shown in Fig. 6-2-2.

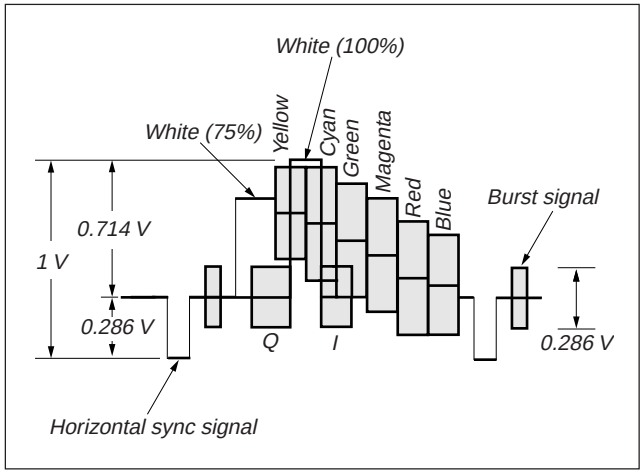


Fig. 6-2-2. Color Bar Signal of Pattern Generator

2-1-4. Alignment Tape

• Contents of KRV-51

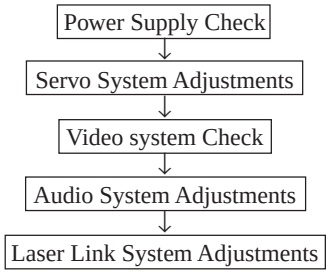
	Mode	Period	Video Signal	Audio Signal	
				Hi-Fi	Normal
1	SP	7 minuted	Color bar	400 Hz (L/R)	400 Hz
2		3 minuted	Monoscope		
3	LP	7 minuted	Color bar		
4		3 minuted	Monoscope		

2-1-5. Input/Output Levels and impedance

Video input: LINE-1 IN/ LINE-2 IN
Input signal: 1 Vp-p, 75 ohms, unbalanced, sync negative
Video output: LINE OUT
Output signal: 1 Vp-p, 75 ohms, unbalanced, sync negative
Audio input: LINE-1 IN/ LINE-2 IN
Input level: –7.5 dBs (0 dBs = 0.775 Vrms)
Input impedance: more than 47 kilohms
Audio output: LINE OUT
Output level: –7.5 dBs at load impedance 47 kilohms
Output impedance: less than 10 kilohms

2-1-6. Adjustment Sequence

The adjustments should be performed in the following sequence.



2-2. POWER SUPPLY CHECK

2-2-1. Power Supply Voltage Check (MA-360 board)

Mode	E-E
Measuring instrument	Digital voltmeter
35 V check	
Measurement point	CN603 pin ⑪
Specified value	37 ± 1 Vdc
13 V check	
Measurement point	CN603 pin ⑨ or ⑩
Specified value	13.2 ± 0.5 Vdc
6 V check	
Measurement point	CN603 pin ④ or ⑤
Specified value	5.9 ± 0.15 Vdc
+F, –F check	
Measurement point	+ probe: CN603 pin ① – probe: CN603 pin ②
Specified value	4.5 ± 0.5 Vdc

[Check Method]

1) Check that each power supply voltage satisfies the specified value.

2-3. SERVO SYSTEM ADJUSTMENT

2-3-1. RF Switching Position Adjustment (MA-360 Board)

[Adjustment Purpose]

To adjust the link of the A-ch and B-ch of the tape playback outputs. To make the unit compatible with other tapes and units. If this specification is not satisfied, the link will appear on the screen and the screen will be disrupted, etc.

Mode	Playback
Signal	Alignment tape: SP mode color bar portion
Measurement Point	CH1: VIDEO LINE OUT terminal CH2: CN270 pin ③ (RF SWP)
Measuring Instrument	Oscilloscope
Specified Value	t = 413 ± 32 μ sec (6.5 ± 0.5 H)

[Adjustment method]

1) Connect JS161 (IC161 pin ㊺) (SW POS ADJ) and GND with a jumper wire.
2) Check that "AP" indicator on the display window turns on.
3) Remove the jumper wire.
3) Press CHANNEL+ and CHANNEL– buttons and adjust the switching position (t) to the specified value.
4) Press PAUSE button to write the data in EEPROM.
5) Check that the display changes to "AH" and mode goes to the Hi-Fi switching position adjustment.
6) Perform "Hi-Fi Switching Position Adjustment".

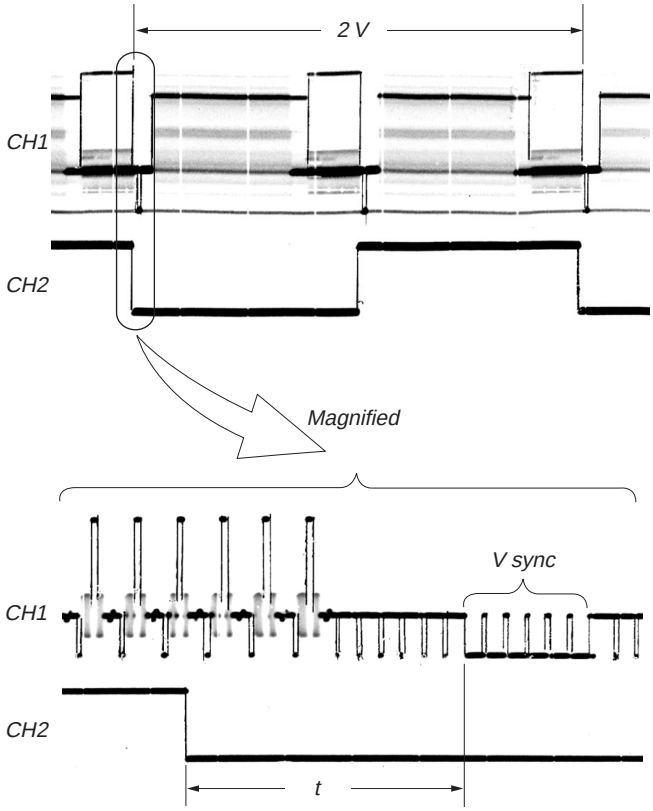


Fig. 6-2-3

2-3-2. Hi-Fi Switching Position Adjustment (MA-360 Board)

[Adjustment Purpose]

To adjust the link of the A-ch and B-ch of the tape playback outputs. To make the unit compatible with other tapes and units. If this specification is not satisfied, the switching noise will be heard, etc.

Mode	Playback
Signal	Alignment tape: SP mode color bar portion
Measurement Point	CH1: CN270 pin ① (HF ADJ) CH2: CN270 pin ③ (RF SWP)
Measuring Instrument	Oscilloscope
Specified Value	A = minimum

Note: Perform "RF Switching Position Adjustment" before this adjustment.

[Adjustment method]

1) Check that "AH" indicator on the display window turns on.
2) Press CHANNEL+ and CHANNEL– buttons and minimize the part A of PB AF RF signal.
3) Press PAUSE button to write the data in EEPROM.
4) Check that the "AH" indicator turns off.

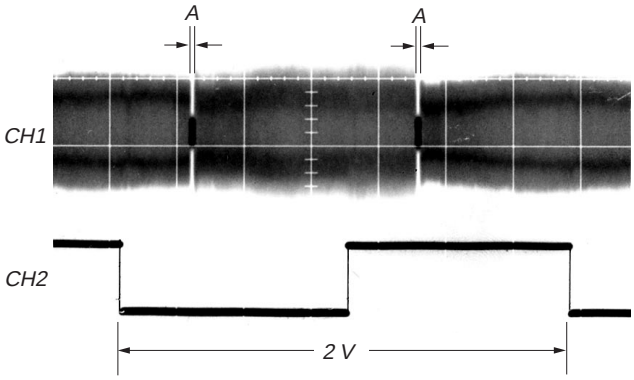


Fig. 6-2-4

2-4. VIDEO SYSTEM CHECK

2-4-1. Playback Level Check (MA-360 board)

[Adjustment purpose]

Confirm that the playback video signal level is within the specification.

Mode	Playback
Signal	Alignment tape: SP mode color bar portion
Measurement Point	CN261 ⑩ pin (VIDEO IN) (CN501 ⑩ pin of VD-29 board)
Measuring Instrument	Oscilloscope
Specified Value	A = 2.10 ± 0.14 V

[Check method]

1) Check that the video signal level (A) satisfies the specified value.

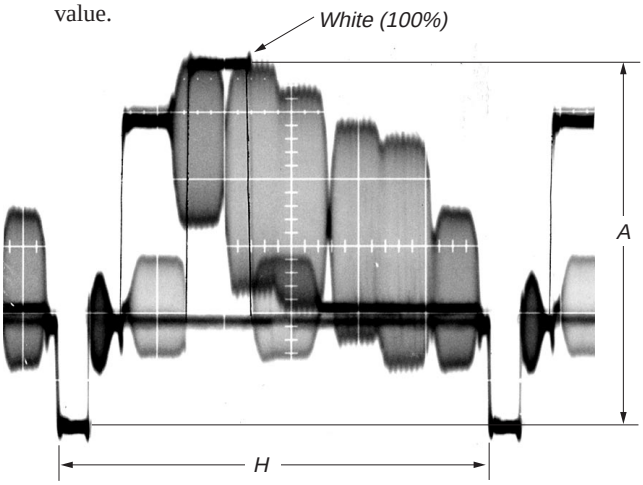


Fig. 6-2-5

2-4-2. Sync AGC Check (MA-360 board)

[Adjustment purpose]

Confirm that the E-E video output level is within the specification.

Mode	E-E
Signal	Color bar
Measurement Point	CN261 ⑩ pin (VIDEO IN) (CN501 ⑩ pin of VD-29 board)
Measuring Instrument	Oscilloscope
Specified Value	A = 2.10 ± 0.14 V

Switch setting:

INPUT SELECT L1

[Check method]

1) Input a color bar signal to VIDEO LINE-1 terminal.
2) Check that the video signal level (A) satisfies the specified value.

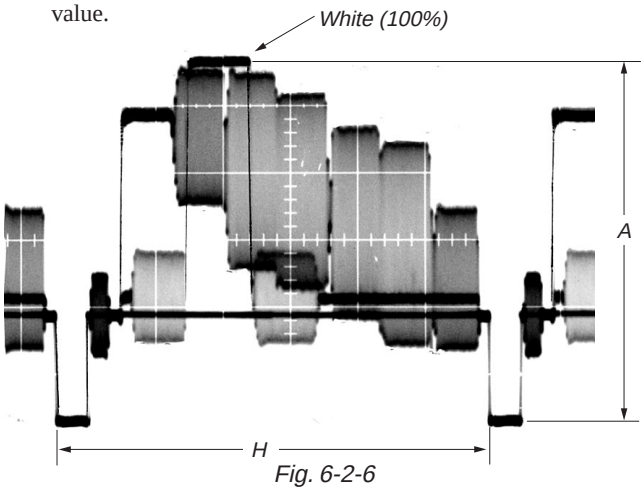


Fig. 6-2-6

2-4-3. Deviation Check

[Adjustment purpose]

Confirm that the YFM signal deviation is within the specification.

Mode	Recording and playback (SP mode)
Signal	Color bar
Measurement Point	CN261 ⑩ pin (VIDEO IN) (CN501 ⑩ pin of VD-29 board)
Measuring Instrument	Oscilloscope
Specified Value	A = 2.10 ± 0.14 V

Note: This check should be carried out upon completion of "Playback Level Check" and "Sync AGC Check".

Switch setting:

INPUT SELECT L1

[Check method]

1) Record the color bar signal.
2) Playback the recorded section.
3) Check that the video signal level (A) satisfies the specified value.

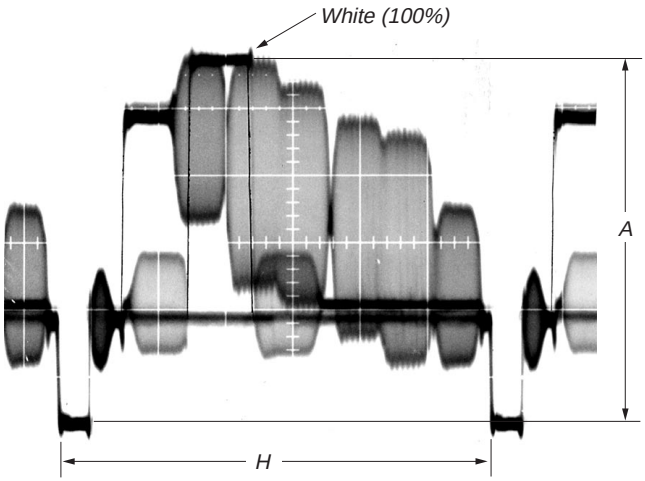


Fig. 6-2-7

2-5. AUDIO SYSTEM ADJUSTMENT

[Connecting Instruments]

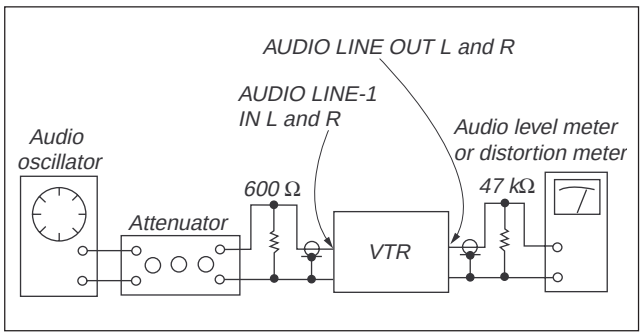


Fig. 6-2-8

2-5-1. Hi-Fi Audio System Check

1. E-E Output Level Check

[Adjustment purpose]

Confirm that the E-E audio output level is within the specification.

Mode	E-E
Signal	400 Hz, –7.5 dB
Measurement Point	AUDIO LINE OUT terminal L and R
Measuring Instrument	Audio level meter
Specified Value	–7.5 ± 2 dBs

Switch setting:

INPUT SELECT L1

[Check method]

1) Input a 400 Hz, –7.5 dBs signal to both L and R channels of AUDIO LINE-1 terminal.
2) Check that the audio output signal satisfies the specified value.

2. Overall Level Characteristics Check

[Adjustment purpose]

Confirm that the level characteristic is within the specification.

Mode	Recording and playback (SP mode)
Signal	400 Hz, –7.5 dBs
Measurement Point	AUDIO LINE OUT terminal L and R
Measuring Instrument	Audio level meter
Specified Value	–7.5 ± 2 dB

Switch setting:

INPUT SELECT L1

[Check method]

1) Input a 400 Hz, –7.5 dBs signal to both L and R channels of AUDIO LINE-1 terminal.
2) Record the signal in the SP mode.
3) Playback the recorded section.
4) Press the AUDIO MONITOR button of the remote commander and select the stereo audio mode (STEREO indicator on the display window turns on.).
5) Check that the 400 Hz signal level satisfies the specified value.

2-5-2. Normal Audio System Adjustment

• Make adjustment in the SP mode unless otherwise specified.
• Use a normal VHS cassette tape for adjustment.

1. ACE Head Adjustment

Refer to the VHS mechanical adjustment manual Ⅵ (S MECHANISM) (9-921-647-11).

2. Frequency Response Check

[Adjustment purpose]

Confirm that the frequency characteristics are within the specification.

Mode	Recording and playback (SP mode)
Signal	① : 400 Hz, –27.5 dBs ② : 7 kHz, –27.5 dBs
Measurement Point	AUDIO LINE OUT terminal L or R
Measuring Instrument	Audio level meter
Specified Value	0 ± 3 dB

Note: Perform "E-E Output Level Check" of "Hi-Fi Audio System Check" before this adjustment.

Switch setting:

INPUT SELECT L1

[Check method]

1) Input a 400 Hz, –27.5 dBs signal to both L and R channels of AUDIO LINE-1 terminal.
2) Record the signal in the SP mode.
3) Input a 7 kHz, –27.5 dBs signal to both L and R channels of AUDIO LINE-1 terminal.
4) Record the signal in the SP mode.
5) Playback the recorded section.
6) Press the AUDIO MONITOR button of the remote commander and select the normal audio mode (STEREO indicator on the display window turns off.).
6) Check that the 7 kHz signal level against to the 400 Hz signal level satisfies the specified value.

2-6. Laser Link System Adjustment

[Connecting Instruments]

Connect the measuring devices as shown in the following figure, and input a color bar signal to the video input of the camcoder with LASER LINK function.

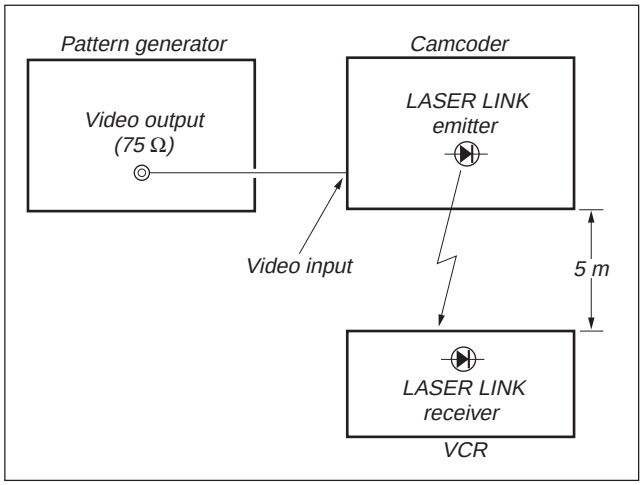


Fig. 6-2-9

2-6-1. Laser Link video output Level Adjustment (LR-15 Board)

[Adjustment purpose]

The Laser link receiver video output level setting.

Mode	E-E
Signal	Color bar
Measurement Point	Pin ④ of CN006 (AV LINK VIDEO)
Measuring Instrument	Oscilloscope
Adjusting element	RV501
Specified Value	A = 1.00 ± 0.05 V

Switch setting:

INPUT SELECT L3

Adjusting method:

1) Input a color bar signal to the video jack of the camcoder.
1) Adjust the video signal level (A) to the specified value with RV501.

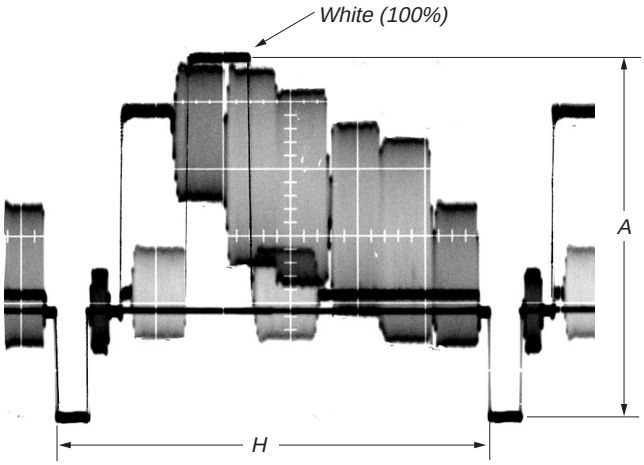


Fig. 6-2-10

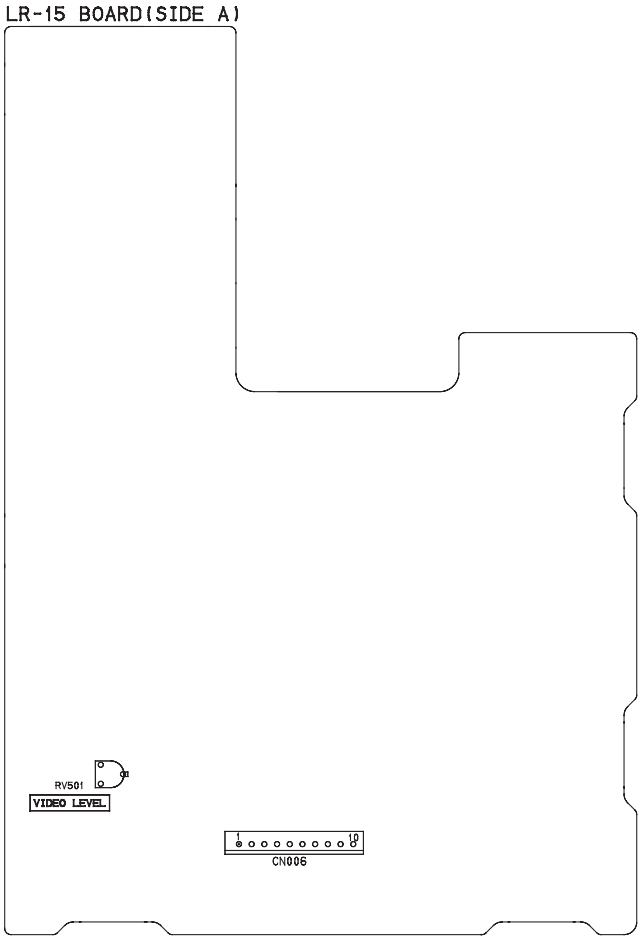


Fig. 6-2-11

SECTION 7
REPAIR PARTS LIST

7-1. EXPLODED VIEWS

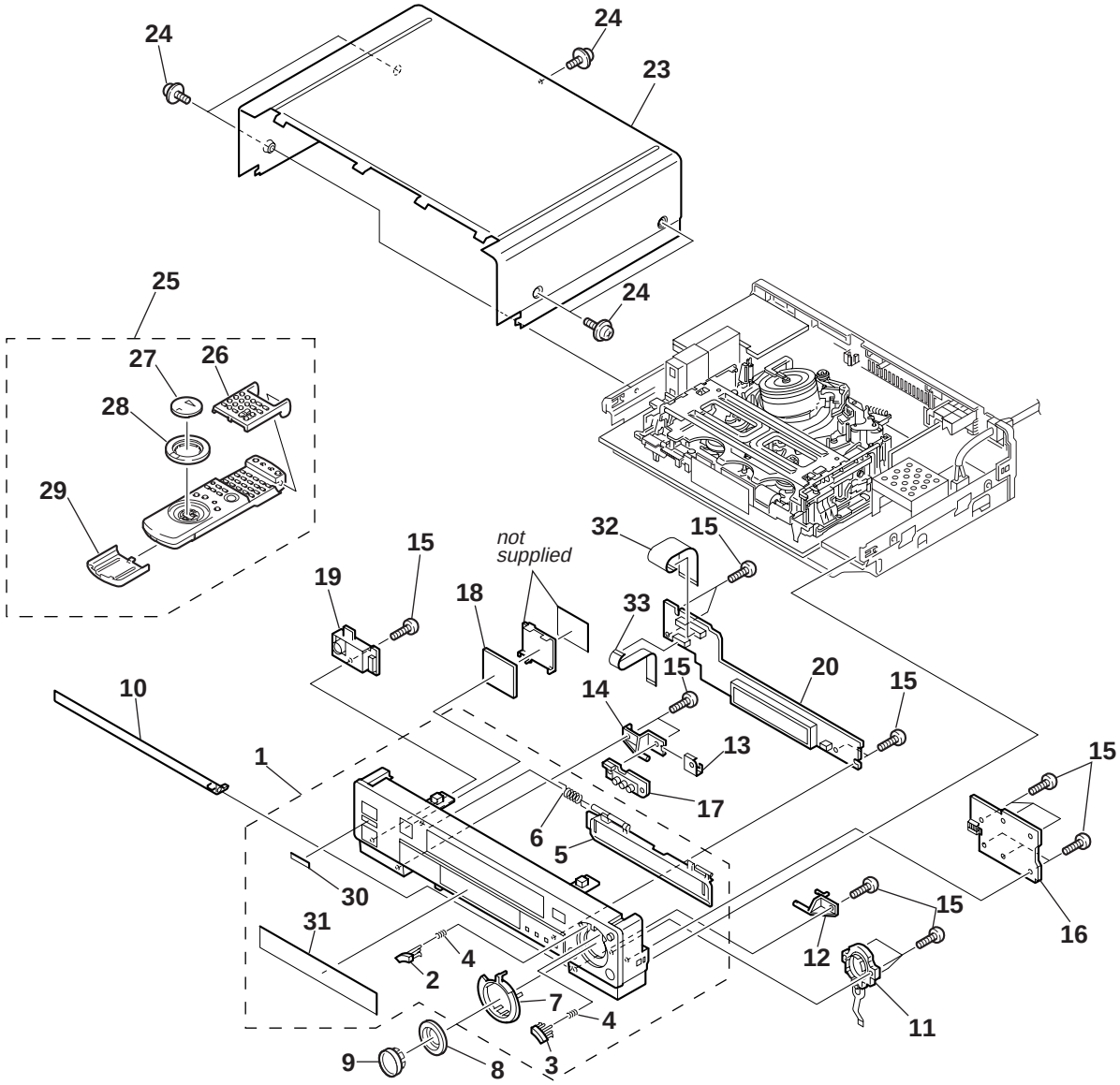
NOTE:

- -XX, -X mean standardized parts, so they may have some differences from the original one.
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- The mechanical parts with no reference number in the exploded views are not supplied.
- Hardware (# mark) list and accessories and packing materials are given in the last of this parts list.

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

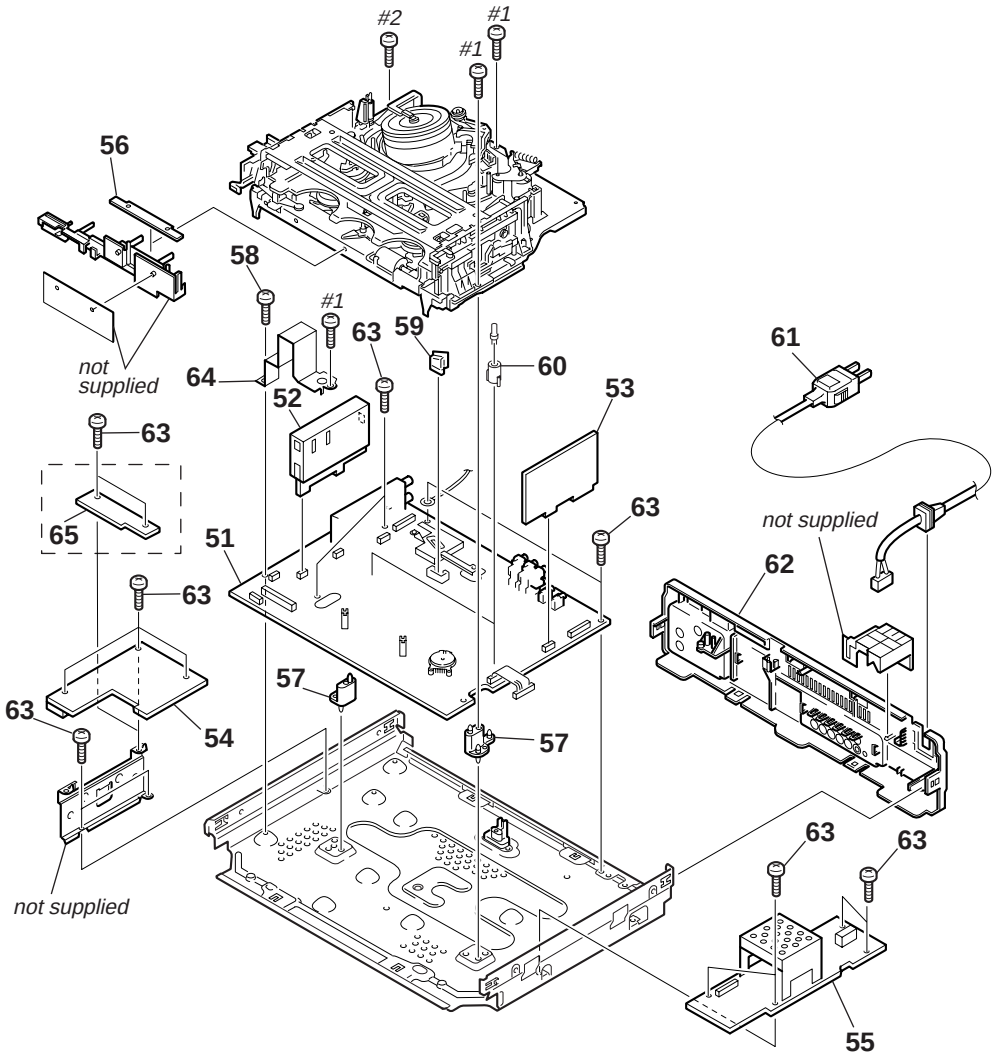
Les composants identifiés par une marque ⚠ sont critiques pour la sécurité.
Ne les remplacer que par une pièce portant le numéro spécifié.

7-1-1. FRONT PANEL ASSEMBLY AND UPPER CASE SECTION



Ref. No.	Part No.	Description	Remarks
1	X-3949-387-1	PANEL ASSY, FRONT (M91HF)	
1	X-3949-388-1	PANEL ASSY, FRONT (M11HF)	
1	X-3949-389-1	PANEL ASSY, FRONT (999HF)	
2	3-054-852-01	BUTTON, REW	
3	3-054-851-01	BUTTON, FF	
4	3-054-865-01	SPRING, COMPRESSION	
5	3-054-846-01	DOOR (DD), CASSETTE	
6	3-953-432-01	SPRING (GE), FL	
7	3-054-854-01	PLATE, RING ORNAMENTAL	
8	3-054-859-01	RING (DD), JOG	
9	3-054-860-01	BUTTON (DD), CENTER	
10	1-418-341-11	SWITCH BLOCK, CONTROL(999HF)	
10	1-418-341-21	SWITCH BLOCK, CONTROL(M11HF)	
10	1-418-341-31	SWITCH BLOCK, CONTROL(M91HF)	
11	1-762-844-21	SWITCH, ROTARY	
12	3-054-862-01	PLATE (RIGHT), FULCRUM	
13	3-054-863-01	HOLDER (DD), SHIELD (M11HF/M91HF)	
14	3-054-861-01	PLATE (LEFT), FULCRUM	
15	4-921-277-41	SCREW (B2.6X8), TAPPING, BIND	
* 16	A-6791-892-A	DM-87 BOARD, COMPLETE	
* 17	A-6791-894-A	JK-172 BOARD, COMPLETE	
* 18	A-6791-895-A	AN-19 BOARD, COMPLETE (M11HF/M91HF)	
* 19	A-6791-901-A	PD-111 BOARD, COMPLETE (M91HF)	
* 20	A-6791-893-A	FR-163 BOARD, COMPLETE (M11HF/M91HF)	
* 20	A-6791-904-A	FR-163A9 BOARD, COMPLETE (999HF)	
23	3-977-136-81	CASE, UPPER	
24	3-710-901-11	SCREW, TAPPING	
25	1-418-154-31	COMMANDER, STANDARD (RMT-V267B)	(M11HF)
25	1-418-376-11	COMMANDER, STANDARD (RMT-V278)	(M91HF)
25	1-418-377-11	COMMANDER, STANDARD (RMT-V280)	(999HF)
26	3-709-472-01	COVER (V278), REMOTE CONTROL (M91HF)	
27	3-972-850-01	BUTTON, FUNCTION (M91HF/999HF)	
28	3-972-783-21	RING, JOG (M91HF)	
28	3-973-077-31	RING, CHANGE SPEED (999HF)	
29	3-709-044-01	COVER, BATTERY (M91HF)	
29	3-709-126-01	COVER, BATTERY (999HF)	
29	3-709-128-01	COVER, BATTERY (M11HF)	
30	3-054-855-01	WINDOW, REMOTE CONTROL	
31	3-054-858-01	FILTER (999HF/M11HF/M91HF)	
32	1-790-579-11	CABLE, FLAT (FFM-29)	
33	1-790-578-11	CABLE, FLAT (FFM-28)	

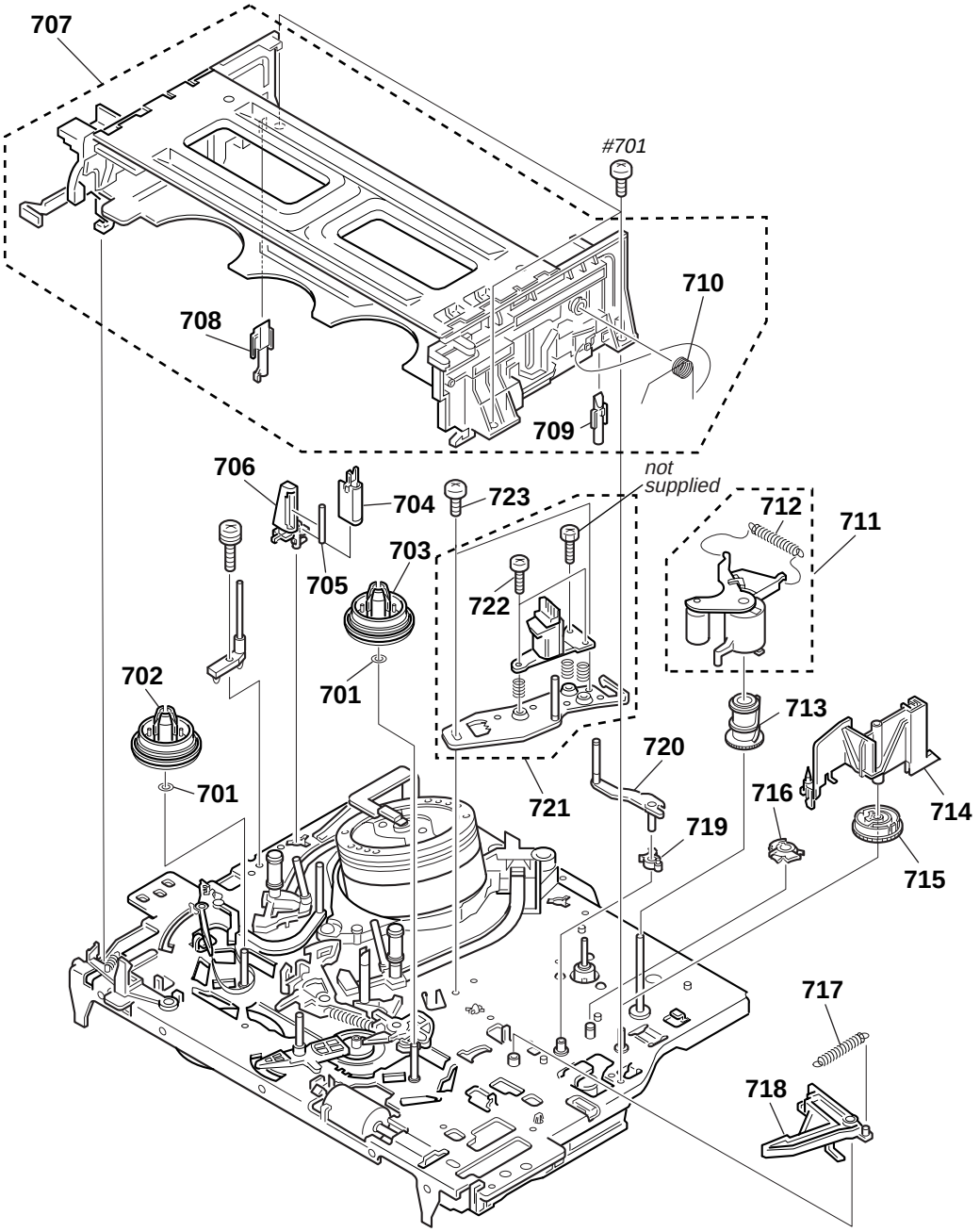
7-1-2. CHASSIS SECTION



Ref. No.	Part No.	Description	Remarks
* 51	A-6791-896-A	MA-360 BOARD, COMPLETE (M11HF)	
* 51	A-6791-902-A	MA-360A11 BOARD, COMPLETE (M91HF)	
* 51	A-6791-905-A	MA-360A9 BOARD, COMPLETE (999HF)	
* 52	A-6791-898-A	ML-18 BOARD, COMPLETE (M11HF/M91HF)	
* 53	A-6791-899-A	VD-29 BOARD, COMPLETE	
* 54	A-6791-903-A	LR-15 BOARD, COMPLETE (M91 HF)	
⚠55	1-468-401-11	POWER BLOCK	
* 56	A-6791-897-A	AN-18 BOARD, COMPLETE (M11HF/M91HF)	
57	3-979-314-01	BASE (R), MD	
58	4-921-277-41	SCREW (B2.6X8), TAPPING, BIND	
59	1-779-725-11	CONNECTOR, BOARD TO BOARD 5P	
60	3-682-057-11	SPACER (SMALL)	
⚠61	1-783-605-12	CORD, POWER 125V 7A (M11HF/M91HF)	
⚠61	1-790-293-11	CORD, POWER 125V 10A (999HF)	
62	3-979-564-81	PANEL, REAR (M11HF/M91HF)	
62	3-979-564-91	PANEL, REAR (999HF)	
63	3-970-608-21	SUMITITE (B3), +BV	
64	3-053-965-01	HOLDER, ML	
* 65	A-6791-900-A	RJ-83 BOARD, COMPLETE (M11HF)	

Note :	**Note :**
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.	Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

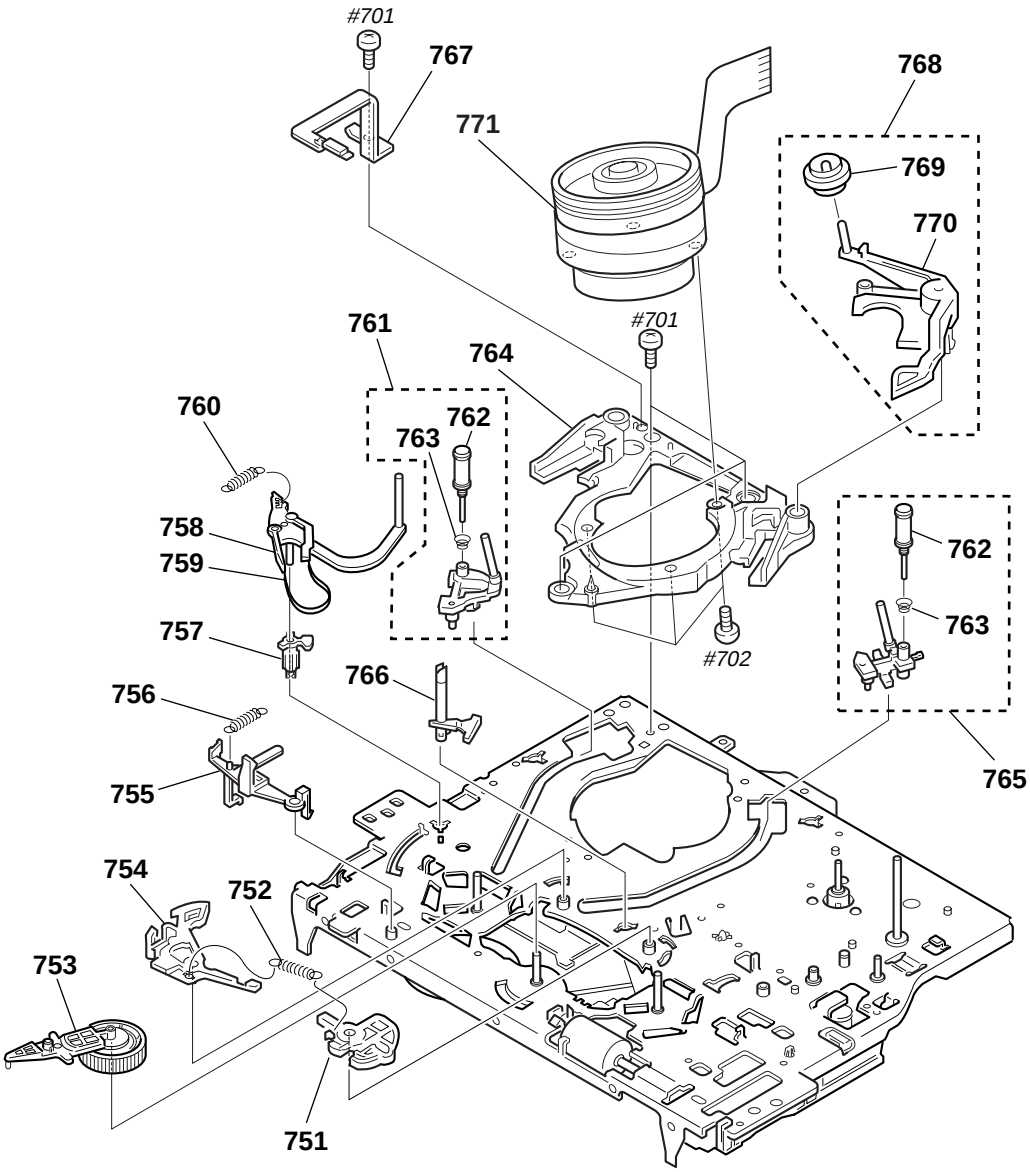
7-1-3. MECHANISM DECK-1



Ref. No.	Part No.	Description	Remarks
701	3-977-509-01	WASHER, THRUST	
702	3-977-507-01	TABLE, REEL (S)(GRAY)	
703	3-977-508-01	TABLE, REEL (T)(BLACK)	
704	1-500-144-11	HEAD, FE	
705	3-977-495-01	SHAFT TG2	
706	3-977-494-01	HOLDER, FEH	
707	A-6759-619-B	FL COMPLETE ASSY	
708	3-977-535-01	PLATE, LUMINOUS(END SENSOR)	
709	3-977-536-01	PLATE, LUMINOUS (TOP SENSOR)	
710	3-970-471-01	SPRING (DECK OPEN), TORSION	
711	A-6759-615-A	PRESS BLOCK ASSY, PINCH	
712	3-958-455-01	SPRING (PINCH), TENSION	

Ref. No.	Part No.	Description	Remarks
713	3-977-447-01	GEAR, ELEVATOR	
714	3-977-514-01	OPENER, LID	
715	3-977-441-03	GEAR, PINCH PRESSING	
716	3-977-445-02	GEAR, TG8 ARM DRIVING	
717	3-977-465-01	SPRING,EXTENSION(RVS BRAKE)	
718	X-3947-582-1	ARM ASSY, RVS BRAKE	
719	3-977-446-01	GEAR, TG8 ARM	
720	X-3947-590-1	TG8 ASSY	
721	A-6759-620-A	HEAD BLOCK ASSY, ACE	
722	3-974-556-11	+ HEXA TT 2.6X9 (TAPER)	
723	3-979-508-01	SCREW +HEXA TP SW 3X8	
728	X-3947-583-1	BRAKE ASSY, CAPSTAN	

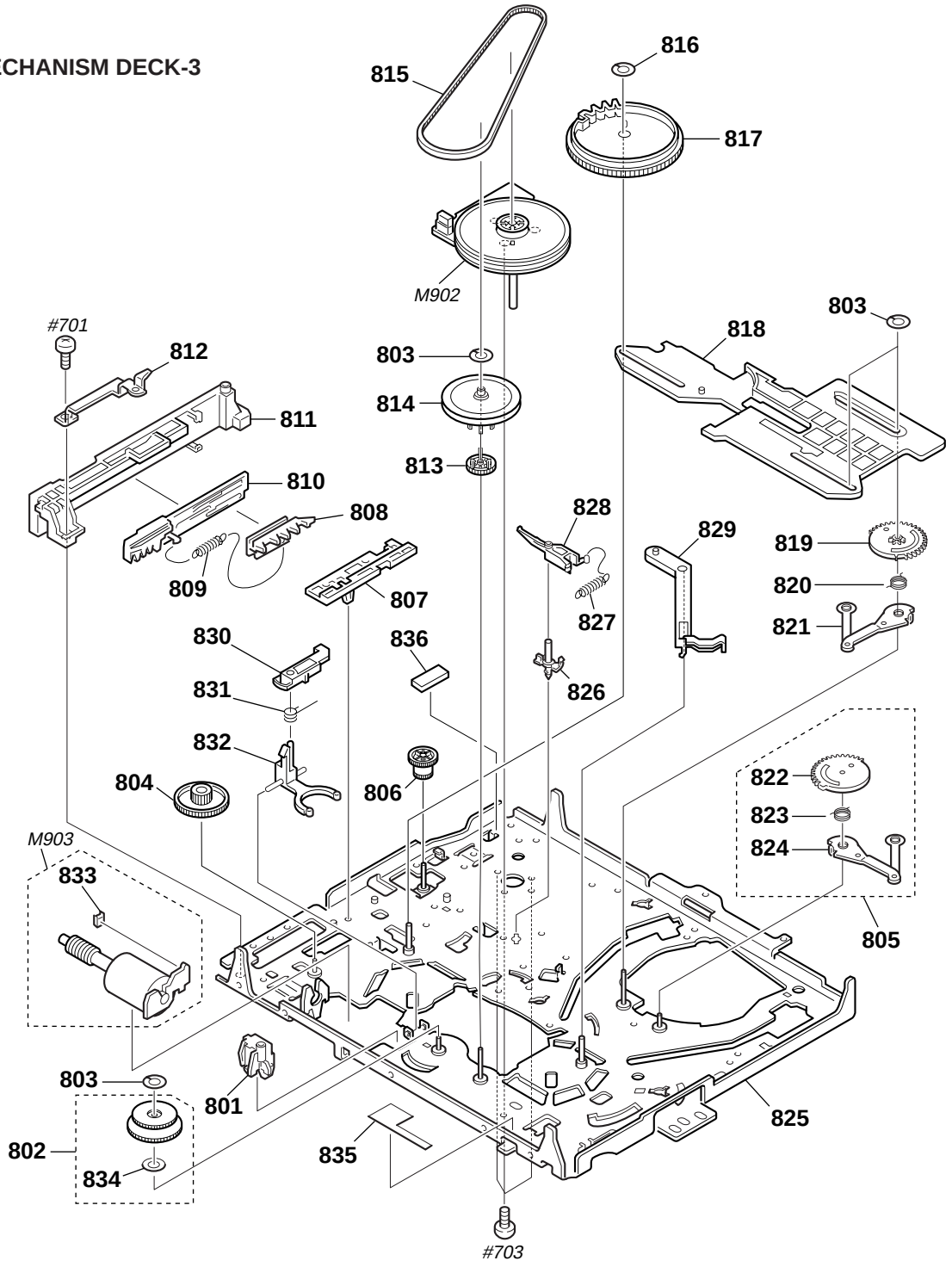
7-1-4. MECHANISM DECK-2



Ref. No.	Part No.	Description	Remarks
751	X-3949-363-1	BRAKE ASSY, MAIN (T)	
752	3-053-882-01	SPRING, TENS (MAIN BRAKE)	
753	X-3947-573-1	ARM ASSY, PENDULUM	
754	X-3949-362-1	BRAKE ASSY, MAIN (S)	
755	3-977-513-02	LEVER, REC. PROOF	
756	3-976-767-01	SPRING, TENS. (REC. PROOF)	
757	3-977-487-01	BOSS, TG1 FULCRUM	
758	X-3947-587-1	TG1 ASSY	
759	X-3947-589-1	BAND ASSY, TG1	
760	3-977-488-01	SPRING (POWER TENSION)	
761	A-6750-324-A	SHUTTLE (S) BLOCK ASSY	

Ref. No.	Part No.	Description	Remarks
762	X-3948-050-1	ROLLER ASS'Y, GUIDE	
763	3-965-178-01	SPRING	
764	3-969-632-04	BASE, DRUM	
765	A-6759-630-A	SHUTTLE (T) BLOCK ASSY	
766	3-977-501-01	PLATE, LUMINOUS	
767	X-3943-899-8	GROUND ASSY, SHAFT	
768	A-6746-074-G	ROLLER BLOCK ASSY, HC	
769	X-3947-255-1	ROLLER ASSY, HC	
770	3-975-724-07	ARM, HC	
771	8-839-058-51	DRUM ASSY, DZH-0A8A/Z-NP (999HF/M91HF)	
771	8-839-057-51	DRUM ASSY, DZH-0A7A/Z-NP (M11HF)	

7-1-5. MECHANISM DECK-3



Ref. No.	Part No.	Description	Remarks
801	3-977-437-01	RETAINER,CAM MOTOR	
802	X-3949-364-1	ASSY, REEL DIRECT SELECT (B)	
803	3-977-443-01	WASHER, STOPPER	
804	3-977-438-01	WORM - WHEEL	
805	A-6759-616-A	GEAR BLOCK ASSY, LOADING(S)	
806	3-977-444-01	GEAR, PINCH TRANSMISSION	
807	3-977-515-01	GUIDE, FL SLIDER	
808	3-977-517-01	PLATE, SLIDE, FL	
809	3-977-519-01	SPRING, TENS. (LIMIT, FL)	
810	3-977-518-02	PLATE, LIMITTER, FL	
811	3-977-516-01	HOLDER, FL SLIDER	
812	3-977-877-01	PLATE, RETAINER	
813	3-977-504-01	GEAR, CLUTCH	
814	X-3949-365-1	GEAR ASSY PULLEY (B)	
815	3-977-510-01	BELT, RUBBER	
816	3-977-440-01	WASHER, STOPPER	
817	3-977-439-01	GEAR, CAM	
818	3-053-878-01	SLIDER (B)	
819	3-977-455-01	GEAR, LOADING(T)	

Ref. No.	Part No.	Description	Remarks
820	3-977-456-03	SPRING, TORSION (LOAD T)	
821	X-3947-579-1	LEVER ASSY, LOADING(T)	
822	3-977-451-01	GEAR, LOADING(S)	
823	3-977-452-01	SPRING, TORSION (LOAD S)	
824	X-3947-578-1	LEVER ASSY, LOADING(S)	
825	X-3947-576-2	CHASSIS ASSY, MECHANICAL	
826	3-977-468-01	SHAFT, CAPSTAN BRAKE	
827	3-977-467-02	SPRING, CAP BRAKE	
829	3-977-489-01	ARM, TG1 DRIVING	
830	3-053-887-01	ARM, DIRECT SELECT (B)	
831	3-053-889-01	SPRING, TORSION (ARM,LIMSEL)	
832	3-053-888-01	BASE, DIRECT SELECT (B)	
833	1-766-723-21	CONNECTOR, BOARD TO BOAR 3P	
834	3-974-477-01	WASHER (GEAR, LIMITTER)	
835	3-989-917-01	SPACER (REC PROOF)	
836	3-054-549-01	RUBBER, SILICON	
M902	1-698-971-11	MOTOR, DC (CAPSTAN)	
M903	X-3947-577-1	MOTOR ASSY, CAM (LOADING)	

7-2. ELECTRICAL PARTS LIST

NOTE:

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- -XX, -X mean standardized parts, so they may have some difference from the original one.
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- CAPACITORS:
  uF: µF
- RESISTORS
  All resistors are in ohms.
  METAL: metal-film resistor
  METAL OXIDE: Metal Oxide-film resistor
  F: nonflammable
- COILS
  uH: µH

When indicating parts by reference number, please include the board name.

- SEMICONDUCTORS
  In each case, u: µ, for example:
  uA...: µA... , uPA... , µPA... ,
  uPB... , µPB... , uPC... , µPC... ,
  uPD..., µPD...

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Les composants identifiés par une marque ⚠ sont critiques pour la sécurité.
Ne les remplacer que par une pièce portant le numéro spécifié.

Ref. No.	Part No.	Description			Remarks
*	A-6791-897-A	AN-18 BOARD, COMPLETE (M11HF/M91HF)			
		**********			
		(Ref.No.:2000 series)			
		< CAPACITOR >			
C201	1-163-136-00	CERAMIC CHIP	620PF	1%	50V
		< CONNECTOR >			
CN201	1-506-468-11	PIN, CONNECTOR 3P			
		< RESISTOR >			
R201	1-216-295-00	METAL CHIP	0	5%	1/10W
R202	1-216-295-00	METAL CHIP	0	5%	1/10W
*	A-6791-895-A	AN-19 BOARD, COMPLETE (M11HF/M91HF)			
		**********			
		(Ref.No.:2000 series)			
		< CAPACITOR >			
C101	1-125-830-91	CERAMIC CHIP	680PF	1%	50V (M11HF/M91HF)
C102	1-163-245-11	CERAMIC CHIP	56PF	5%	50V (M11HF/M91HF)
		< CONNECTOR >			
CN101	1-506-468-11	PIN, CONNECTOR 3P (M11HF/M91HF)			
		< RESISTOR >			
R488	1-216-025-91	RES,CHIP	100	5%	1/10W (M11HF/M91HF)
R490	1-216-025-91	RES,CHIP	100	5%	1/10W (M11HF/M91HF)
R492	1-216-295-00	METAL CHIP	0	5%	1/10W (M11HF/M91HF)
*	A-6791-892-A	DM-87 BOARD, COMPLETE			
		**********			
		(Ref.No.:2000 series)			
		< CONNECTOR >			
CN600	1-565-777-11	CONNECTOR, BOARD TO BOARD 8P			
CN601	1-695-328-11	PIN, CONNECTOR (PC BOARD) 5P			
		< DIODE >			
D600	8-719-056-06	DIODE SLR-342DCT31 (JOG LED)			
		< JUMPER RESISTOR >			
JR600	1-216-295-00	METAL CHIP	0	5%	1/10W
		< TRANSISTOR >			
Q600	8-729-424-08	TRANSISTOR	MUN2111T1		
		< RESISTOR >			
R600	1-216-029-00	METAL CHIP	150	5%	1/10W
R601	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R602	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R603	1-216-061-91	RES,CHIP	3.3K	5%	1/10W
R604	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R605	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R606	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
		< SWITCH >			
S600	1-762-196-21	SWITCH, TACT (OK(M11HF/M91HF)), (CH+(999HF))			
S601	1-762-196-21	SWITCH, TACT (◀◀ REW)			
S602	1-762-196-21	SWITCH, TACT (⏏ EJECT)			
S603	1-762-196-21	SWITCH, TACT (● REC)			
S604	1-762-196-21	SWITCH, TACT (JOG)			
S605	1-762-196-21	SWITCH, TACT (▶▶ FF)			
S606	1-762-196-21	SWITCH, TACT (❚❚ PAUSE)			
*	A-6791-893-A	FR-163 BOARD, COMPLETE (M11HF/M91HF)			
		**********			
*	A-6791-904-A	FR-163 BOARD, COMPLETE (999HF)			
		**********			
		(Ref.No.:2000 series)			
*	3-972-792-01	HOLDER (129), FL			
		< BUZZER >			
BZ400	1-529-104-11	BUZZER, PIEZOELECTRIC			
		< CAPACITOR >			
C400	1-104-760-11	CERAMIC CHIP	0.047uF	10%	50V

Ref. No.	Part No.	Description	Remarks
		< CONNECTOR >	
CN401	1-695-328-11	PIN, CONNECTOR (PC BOARD) 5P	
CN421	1-784-494-11	CONNECTOR, FFC/FPC 15P	
CN422	1-784-510-11	CONNECTOR, FFC/FPC 31P	
CN423	1-568-669-11	CONNECTOR, BOARD TO BOARD 8P	
		< DIODE >	
D400	8-719-056-07	DIODE SLR-342MCT31	
D401	8-719-056-06	DIODE SLR-342DCT31	
D402	8-719-056-06	DIODE SLR-342DCT31 (M11HF/M91HF)	
		< IC >	
IC400	8-749-011-05	IC GP1U28X	
		< JUMPER RESISTOR >	
JR401	1-216-296-00	METAL CHIP 0 5%	1/8W
JR402	1-216-296-00	METAL CHIP 0 5%	1/8W
		< FLUORESCENT INDICATOR >	
ND400	1-517-850-11	TUBE, FLUORESCENT INDICATOR	
		< TRANSISTOR >	
Q400	8-729-421-22	TRANSISTOR MUN2211T1	
Q401	8-729-421-22	TRANSISTOR MUN2211T1	
Q402	8-729-421-22	TRANSISTOR MUN2211T1 (M11HF/M91HF)	
		< RESISTOR >	
R400	1-216-089-00	METAL CHIP 47K 5%	1/10W
R401	1-216-029-00	METAL CHIP 150 5%	1/10W
R402	1-216-029-00	METAL CHIP 150 5%	1/10W
R403	1-216-029-00	METAL CHIP 150 5%	1/10W (M11HF/M91HF)
R404	1-216-057-00	METAL CHIP 2.2K 5%	1/10W
R405	1-216-057-00	METAL CHIP 2.2K 5%	1/10W
R406	1-216-061-91	RES,CHIP 3.3K 5%	1/10W (M11HF/M91HF)
R407	1-216-049-00	METAL CHIP 1K 5%	1/10W
		< SWITCH >	
S400	1-762-196-21	SWITCH, TACT (I / ⏻ POWER)	
S401	1-762-196-21	SWITCH, TACT (CH– / ↑)	
S402	1-762-196-21	SWITCH, TACT (SMART FILE / INPUT SELECT)	
S403	1-762-196-21	SWITCH, TACT (↓ / ARC)	
*	A-6791-894-A	JK-172 BOARD, COMPLETE ********** (Ref.No.:2000 series)	
		< CAPACITOR >	
C493	1-163-009-11	CERAMIC CHIP 0.001uF 10%	50V
C495	1-163-009-11	CERAMIC CHIP 0.001uF 10%	50V
C496	1-163-009-11	CERAMIC CHIP 0.001uF 10%	50V
		< CONNECTOR >	
CN491	1-506-470-11	PIN, CONNECTOR 5P	
		< JACK >	
CNJ491	1-774-509-11	JACK, PIN 3P (LINE2 IN(VIDEO/AUDIO L/R)	
		< DIODE >	
D491	8-719-421-59	DIODE MA3075WA-(TX)	
D492	8-719-421-59	DIODE MA3075WA-(TX)	
D493	8-719-422-37	DIODE MA8051-TX	
D494	8-719-421-59	DIODE MA3075WA-(TX)	
		< JUMPER RESISTOR >	
JR490	1-216-296-00	METAL CHIP 0 5%	1/8W
JR491	1-216-296-00	METAL CHIP 0 5%	1/8W
JR492	1-216-295-00	METAL CHIP 0 5%	1/10W
		< RESISTOR >	
R491	1-216-295-00	METAL CHIP 0 5%	1/10W
R492	1-216-295-00	METAL CHIP 0 5%	1/10W
R493	1-216-022-00	METAL CHIP 75 5%	1/10W
*	A-6791-903-A	LR-15 BOARD, COMPLETE (M91HF) ********** (Ref.No.:4000 series)	
		< CAPACITOR >	
C020	1-126-960-11	ELECT 1uF 20%	50V
C021	1-163-257-11	CERAMIC CHIP 180PF 5%	50V
C022	1-164-232-11	CERAMIC CHIP 0.01uF	50V
C023	1-163-257-11	CERAMIC CHIP 180PF 5%	50V
C024	1-164-004-11	CERAMIC CHIP 0.1uF 10%	25V
* C102	1-165-319-11	CERAMIC CHIP 0.1uF	50V
C110	1-164-004-11	CERAMIC CHIP 0.1uF 10%	25V
C111	1-104-664-11	ELECT 47uF 20%	16V
C112	1-164-004-11	CERAMIC CHIP 0.1uF 10%	25V
C116	1-104-664-11	ELECT 47uF 20%	16V
C118	1-126-947-11	ELECT 47uF 20%	35V
C119	1-126-925-11	ELECT 470uF 20%	10V
C201	1-163-121-00	CERAMIC CHIP 150PF 5%	50V
C202	1-163-121-00	CERAMIC CHIP 150PF 5%	50V
C401	1-163-243-11	CERAMIC CHIP 47PF 5%	50V
C402	1-163-243-11	CERAMIC CHIP 47PF 5%	50V
C403	1-164-232-11	CERAMIC CHIP 0.01uF	50V
C404	1-163-116-00	CERAMIC CHIP 91PF 5%	50V
C405	1-164-232-11	CERAMIC CHIP 0.01uF	50V
C406	1-163-253-11	CERAMIC CHIP 120PF 5%	50V
C407	1-126-933-11	ELECT 100uF 20%	16V
C408	1-164-004-11	CERAMIC CHIP 0.1uF 10%	25V
C409	1-164-232-11	CERAMIC CHIP 0.01uF	50V
C410	1-164-232-11	CERAMIC CHIP 0.01uF	50V
C411	1-164-232-11	CERAMIC CHIP 0.01uF	50V
C412	1-164-232-11	CERAMIC CHIP 0.01uF	50V
C413	1-163-096-00	CERAMIC CHIP 13PF 5%	50V
C414	1-126-960-11	ELECT 1uF 20%	50V
C415	1-163-257-11	CERAMIC CHIP 180PF 5%	50V
C416	1-163-257-11	CERAMIC CHIP 180PF 5%	50V

Ref. No.	Part No.	Description			Remarks
C417	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C418	1-163-024-00	CERAMIC CHIP	0.018uF	10%	50V
C419	1-126-160-11	ELECT	1uF	20%	50V
C420	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C421	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C422	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C423	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C424	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C425	1-163-024-00	CERAMIC CHIP	0.018uF	10%	50V
C426	1-126-960-11	ELECT	1uF	20%	50V
C430	1-126-933-11	ELECT	100uF	20%	16V
C431	1-126-933-11	ELECT	100uF	20%	16V
C432	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C433	1-126-964-11	ELECT	10uF	20%	50V
C436	1-104-664-11	ELECT	47uF	20%	16V
C437	1-126-960-11	ELECT	1uF	20%	50V
C438	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C439	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C440	1-163-091-00	CERAMIC CHIP	8PF		50V
C441	1-163-233-11	CERAMIC CHIP	18PF	5%	50V
C442	1-126-160-11	ELECT	1uF	20%	50V
C443	1-126-160-11	ELECT	1uF	20%	50V
C501	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C502	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C503	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C504	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C505	1-163-253-11	CERAMIC CHIP	120PF	5%	50V
C507	1-126-933-11	ELECT	100uF	20%	16V
C508	1-124-584-00	ELECT	100uF	20%	10V
C509	1-163-233-11	CERAMIC CHIP	18PF	5%	50V
C510	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C511	1-163-245-11	CERAMIC CHIP	56PF	5%	50V
C512	1-163-222-11	CERAMIC CHIP	5PF	0.25PF	50V
C513	1-163-233-11	CERAMIC CHIP	18PF	5%	50V
C514	1-126-933-11	ELECT	100uF	20%	16V
C515	1-163-113-00	CERAMIC CHIP	68PF	5%	50V
C516	1-126-933-11	ELECT	100uF	20%	16V
C517	1-124-589-11	ELECT	47uF	20%	16V
C518	1-126-933-11	ELECT	100uF	20%	16V
C519	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C520	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C521	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C522	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C523	1-163-220-11	CERAMIC CHIP	3PF	0.25PF	50V
C524	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C625	1-126-967-11	ELECT	47uF	20%	50V
		< CONNECTOR >			
* CN006	1-506-475-11	PIN, CONNECTOR 10P			
* CN602	1-573-735-11	PIN, CONNECTOR 8P			
		< DIODE >			
D003	8-719-800-76	DIODE MA153-TX			
D401	8-719-800-76	DIODE MA153-TX			
D404	8-719-801-78	DIODE MA152WK-TX			
D602	8-719-018-07	DIODE MA8270-TX			
D904	8-719-801-78	DIODE MA152WK-TX			

Ref. No.	Part No.	Description			Remarks
		< IC >			
IC402	8-759-473-72	IC SC111711DR2			
IC403	8-759-473-72	IC SC111711DR2			
IC404	8-759-701-39	IC NJM3404AM-TE1			
IC501	8-759-377-76	IC MC10115P			
IC502	8-759-377-75	IC MC10107P			
IC503	8-759-262-03	IC MC14577CFEL			
IC504	8-759-069-28	IC PQ05RF11			
		< COIL >			
L102	1-414-938-21	INDUCTOR	47uH		
L104	1-414-938-21	INDUCTOR	47uH		
L106	1-414-938-21	INDUCTOR	47uH		
L401	1-412-955-11	INDUCTOR	22uH		
L402	1-412-952-11	INDUCTOR	12uH		
L403	1-412-951-11	INDUCTOR	10uH		
L408	1-412-958-21	INDUCTOR	39uH		
L501	1-412-957-11	INDUCTOR	33uH		
L502	1-412-957-11	INDUCTOR	33uH		
		< TRANSISTOR >			
Q005	8-729-120-28	TRANSISTOR	2SC1623-T1-L5L6		
Q401	8-729-010-25	TRANSISTOR	MSD601-RT1		
Q403	8-729-424-18	TRANSISTOR	UN2113-TX		
Q404	8-729-010-05	TRANSISTOR	MSB709-RT1		
Q405	8-729-010-25	TRANSISTOR	MSD601-RT1		
Q406	8-729-010-25	TRANSISTOR	MSD601-RT1		
Q407	8-729-421-19	TRANSISTOR	MUN2213T1		
Q501	8-729-010-05	TRANSISTOR	MSB709-RT1		
Q502	8-729-102-07	TRANSISTOR	2SC2223-T1F13F14		
		< RESISTOR >			
R013	1-216-097-91	RES,CHIP	100K	5%	1/10W
R014	1-216-107-00	METAL CHIP	270K	5%	1/10W
R016	1-216-079-00	METAL CHIP	18K	5%	1/10W
R017	1-216-037-00	METAL CHIP	330	5%	1/10W
R023	1-216-049-00	METAL CHIP	1K	5%	1/10W
R401	1-216-041-00	METAL CHIP	470	5%	1/10W
R402	1-216-041-00	METAL CHIP	470	5%	1/10W
R403	1-216-049-00	METAL CHIP	1K	5%	1/10W
R405	1-216-069-00	METAL CHIP	6.8K	5%	1/10W
R406	1-216-097-91	RES,CHIP	100K	5%	1/10W
R407	1-216-107-00	METAL CHIP	270K	5%	1/10W
R408	1-216-071-00	METAL CHIP	8.2K	5%	1/10W
R409	1-216-037-00	METAL CHIP	330	5%	1/10W
R410	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R411	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R412	1-216-069-00	METAL CHIP	6.8K	5%	1/10W
R413	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R415	1-216-073-00	METAL CHIP	10K	5%	1/10W
R416	1-216-073-00	METAL CHIP	10K	5%	1/10W
R419	1-216-689-11	METAL CHIP	39K	0.5%	1/10W
R420	1-216-689-11	METAL CHIP	39K	0.5%	1/10W
R421	1-216-077-00	METAL CHIP	15K	5%	1/10W
R422	1-216-077-00	METAL CHIP	15K	5%	1/10W
R423	1-216-085-00	METAL CHIP	33K	5%	1/10W
R424	1-216-085-00	METAL CHIP	33K	5%	1/10W

Ref. No.	Part No.	Description			Remarks
R425	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R429	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R432	1-216-035-00	METAL CHIP	270	5%	1/10W
R434	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R435	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R436	1-216-073-00	METAL CHIP	10K	5%	1/10W
R437	1-216-073-00	METAL CHIP	10K	5%	1/10W
R438	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R440	1-216-083-00	METAL CHIP	27K	5%	1/10W
R441	1-216-063-91	RES,CHIP	3.9K	5%	1/10W
R442	1-216-081-00	METAL CHIP	22K	5%	1/10W
R443	1-216-063-91	RES,CHIP	3.9K	5%	1/10W
R501	1-216-029-00	METAL CHIP	150	5%	1/10W
R502	1-216-025-91	RES,CHIP	100	5%	1/10W
R503	1-216-059-00	METAL CHIP	2.7K	5%	1/10W
R504	1-216-049-00	METAL CHIP	1K	5%	1/10W
R505	1-216-031-00	METAL CHIP	180	5%	1/10W
R506	1-216-059-00	METAL CHIP	2.7K	5%	1/10W
R507	1-216-049-00	METAL CHIP	1K	5%	1/10W
R508	1-216-017-91	RES,CHIP	47	5%	1/10W
R509	1-216-019-00	METAL CHIP	56	5%	1/10W
R510	1-216-019-00	METAL CHIP	56	5%	1/10W
R511	1-216-025-91	RES,CHIP	100	5%	1/10W
R512	1-216-033-00	METAL CHIP	220	5%	1/10W
R513	1-216-035-00	METAL CHIP	270	5%	1/10W
R514	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R515	1-216-055-00	METAL CHIP	1.8K	5%	1/10W
R516	1-216-073-00	METAL CHIP	10K	5%	1/10W
R517	1-216-061-91	RES,CHIP	3.3K	5%	1/10W
R518	1-216-049-00	METAL CHIP	1K	5%	1/10W
R519	1-216-031-00	METAL CHIP	180	5%	1/10W
R520	1-216-059-00	METAL CHIP	2.7K	5%	1/10W
R521	1-216-073-00	METAL CHIP	10K	5%	1/10W
R522	1-216-071-00	METAL CHIP	8.2K	5%	1/10W
R523	1-216-073-00	METAL CHIP	10K	5%	1/10W
R524	1-216-059-00	METAL CHIP	2.7K	5%	1/10W
R525	1-216-067-00	METAL CHIP	5.6K	5%	1/10W
R526	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R527	1-216-073-00	METAL CHIP	10K	5%	1/10W
R528	1-216-021-00	METAL CHIP	68	5%	1/10W
R529	1-216-089-00	METAL CHIP	47K	5%	1/10W
R902	1-216-298-00	METAL CHIP	2.2	5%	1/10W
R904	1-216-295-00	METAL CHIP	0	5%	1/10W
		< VARIABLE RESISTOR >			
RV501	1-237-722-11	RES, ADJ, CARBON 2.2K			

Ref. No.	Part No.	Description	Remarks
*	A-6791-896-A	MA-360A10 BOARD, COMPLETE (M11HF)	
		**********	
*	A-6791-902-A	MA-360A11 BOARD, COMPLETE (M91HF)	
		**********	
*	A-6791-905-A	MA-360A9 BOARD, COMPLETE (999HF)	
		**********	
			(Ref.No.:1000 series)
*	3-960-273-01	SPACER, TOP END	
*	3-960-274-01	SPACER, LED	
		< CAPACITOR >	

C101	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C102	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C103	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C104	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C105	1-128-057-11	ELECT	330uF	20%	6.3V
C106	1-124-589-11	ELECT	47uF	20%	16V
C108	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C109	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C111	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C112	1-164-159-21	CERAMIC	0.1uF		50V
C118	1-137-441-11	FILM	0.027uF	5%	50V
C119	1-126-157-11	ELECT	10uF	20%	16V
C120	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C121	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C122	1-124-589-11	ELECT	47uF	20%	16V
C123	1-137-372-11	FILM	0.022uF	5%	50V
C140	1-124-589-11	ELECT	47uF	20%	16V
C141	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C142	1-128-131-11	ELECT	22uF	20%	50V
C143	1-124-257-00	ELECT	2.2uF	20%	50V
C144	1-104-852-11	TANTAL. CHIP	22uF	20%	10V
C145	1-104-852-11	TANTAL. CHIP	22uF	20%	10V
C146	1-164-182-11	CERAMIC CHIP	0.0033uF	10%	50V
C148	1-163-020-00	CERAMIC CHIP	0.0082uF	10%	50V
C149	1-163-020-00	CERAMIC CHIP	0.0082uF	10%	50V
C150	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C160	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C161	1-163-229-11	CERAMIC CHIP	12PF	5%	50V
C162	1-163-229-11	CERAMIC CHIP	12PF	5%	50V
C163	1-124-589-11	ELECT	47uF	20%	16V
C164	1-164-489-11	CERAMIC CHIP	0.22uF	10%	16V
C165	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C166	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C172	1-124-584-00	ELECT	100uF	20%	10V
C173	1-164-159-21	CERAMIC	0.1uF		50V
C201	1-104-760-11	CERAMIC CHIP	0.047uF	10%	50V
C202	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C203	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C204	1-109-982-11	CERAMIC CHIP	1uF	10%	10V
C205	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C206	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C207	1-163-241-11	CERAMIC CHIP	39PF	5%	50V
C208	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C209	1-124-589-11	ELECT	47uF	20%	16V
C210	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V

Ref. No.	Part No.	Description			Remarks
C211	1-163-239-11	CERAMIC CHIP	33PF	5%	50V
C213	1-163-131-00	CERAMIC CHIP	390PF	5%	50V
C214	1-163-257-11	CERAMIC CHIP	180PF	5%	50V
C215	1-163-235-11	CERAMIC CHIP	22PF	5%	50V
C216	1-126-160-11	ELECT	1uF	20%	50V
C217	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C220	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C221	1-109-982-11	CERAMIC CHIP	1uF	10%	10V
C222	1-124-261-00	ELECT	10uF	20%	50V
C223	1-128-131-11	ELECT	22uF	20%	50V
C224	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C225	1-124-464-11	ELECT	0.22uF	20%	50V
C226	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C227	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C228	1-124-589-11	ELECT	47uF	20%	16V
C229	1-109-982-11	CERAMIC CHIP	1uF	10%	10V
C230	1-164-159-21	CERAMIC	0.1uF		50V
C231	1-124-589-11	ELECT	47uF	20%	16V
C232	1-109-982-11	CERAMIC CHIP	1uF	10%	10V
C233	1-124-261-00	ELECT	10uF	20%	50V
C234	1-109-982-11	CERAMIC CHIP	1uF	10%	10V
C235	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C236	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C237	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C238	1-124-589-11	ELECT	47uF	20%	16V
C239	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C240	1-124-589-11	ELECT	47uF	20%	16V
C241	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C242	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C243	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C244	1-109-982-11	CERAMIC CHIP	1uF	10%	10V
C245	1-109-982-11	CERAMIC CHIP	1uF	10%	10V
C246	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C247	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C248	1-163-809-11	CERAMIC CHIP	0.047uF	10%	25V
C249	1-109-982-11	CERAMIC CHIP	1uF	10%	10V
C250	1-163-809-11	CERAMIC CHIP	0.047uF	10%	25V
C251	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C253	1-163-237-11	CERAMIC CHIP	27PF	5%	50V
C254	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C260	1-104-664-11	ELECT	47uF	20%	16V (M91HF)
C261	1-104-664-11	ELECT	47uF	20%	16V (M91HF)
C262	1-163-233-11	CERAMIC CHIP	18PF	5%	50V (M91HF/999HF)
C263	1-163-233-11	CERAMIC CHIP	18PF	5%	50V (M91HF/999HF)
C266	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C268	1-164-232-11	CERAMIC CHIP	0.01uF		50V (M91HF)
C269	1-124-589-11	ELECT	47uF	20%	16V (M91HF)
C271	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C272	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C275	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C276	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C278	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C279	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C280	1-124-584-00	ELECT	100uF	20%	10V
C281	1-164-232-11	CERAMIC CHIP	0.01uF		50V

Ref. No.	Part No.	Description			Remarks
C282	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C283	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C284	1-164-489-11	CERAMIC CHIP	0.22uF	10%	16V
C285	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C287	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C301	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C303	1-126-160-11	ELECT	1uF	20%	50V
C305	1-126-964-11	ELECT	10uF	20%	50V
C307	1-126-966-11	ELECT	33uF	20%	16V
C308	1-126-963-11	ELECT	4.7uF	20%	50V
C310	1-126-160-11	ELECT	1uF	20%	50V
C311	1-163-014-00	CERAMIC CHIP	0.0027uF	10%	50V
C312	1-163-016-00	CERAMIC CHIP	0.0039uF	10%	50V
C313	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C314	1-126-964-11	ELECT	10uF	20%	50V
C315	1-126-160-11	ELECT	1uF	20%	50V
C316	1-163-024-00	CERAMIC CHIP	0.018uF	10%	50V
C317	1-104-664-11	ELECT	47uF	20%	16V
C318	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C319	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C320	1-137-462-11	FILM	0.018uF	5%	100V (999HF/M91HF)
C320	1-137-374-11	FILM	0.047uF	5%	50V (M11HF)
C322	1-126-963-11	ELECT	4.7uF	20%	50V
C323	1-163-135-00	CERAMIC CHIP	560PF	5%	50V
C324	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C325	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C361	1-126-964-11	ELECT	10uF	20%	50V
C362	1-163-020-00	CERAMIC CHIP	0.0082uF	10%	50V
C363	1-104-664-11	ELECT	47uF	20%	16V
C364	1-126-964-11	ELECT	10uF	20%	50V
C365	1-126-961-11	ELECT	2.2uF	20%	50V
C366	1-126-964-11	ELECT	10uF	20%	50V
C367	1-104-664-11	ELECT	47uF	20%	16V
C368	1-163-020-00	CERAMIC CHIP	0.0082uF	10%	50V
C369	1-126-964-11	ELECT	10uF	20%	50V
C370	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C371	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C372	1-124-589-11	ELECT	47uF	20%	16V
C373	1-124-589-11	ELECT	47uF	20%	16V
C374	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C375	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C376	1-124-261-00	ELECT	10uF	20%	50V
C381	1-164-222-11	CERAMIC CHIP	0.22uF		25V
C382	1-164-222-11	CERAMIC CHIP	0.22uF		25V
C383	1-126-960-11	ELECT	1uF	20%	50V
C384	1-126-960-11	ELECT	1uF	20%	50V
C385	1-126-160-11	ELECT	1uF	20%	50V
C386	1-124-261-00	ELECT	10uF	20%	50V
C387	1-126-964-11	ELECT	10uF	20%	50V
C388	1-126-964-11	ELECT	10uF	20%	50V
C389	1-124-261-00	ELECT	10uF	20%	50V
C390	1-126-160-11	ELECT	1uF	20%	50V
C391	1-126-160-11	ELECT	1uF	20%	50V
C460	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C461	1-164-232-11	CERAMIC CHIP	0.01uF		50V

Ref. No.	Part No.	Description			Remarks
C462	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C463	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C464	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C465	1-126-916-11	ELECT	1000uF	20%	6.3V
C466	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C467	1-126-935-11	ELECT	470uF	20%	6.3V
C468	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C469	1-104-905-11	CAPACITOR	0.22F		5.5V
C471	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C472	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C473	1-163-235-11	CERAMIC CHIP	22PF	5%	50V
C474	1-163-102-00	CERAMIC CHIP	24PF	5%	50V
C475	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C476	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C477	1-163-229-11	CERAMIC CHIP	12PF	5%	50V
C478	1-163-229-11	CERAMIC CHIP	12PF	5%	50V
C479	1-124-247-91	ELECT	10uF	20%	35V
C561	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C562	1-104-664-11	ELECT	47uF	20%	16V
C563	1-126-935-11	ELECT	470uF	20%	6.3V
C564	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C570	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C571	1-126-160-11	ELECT	1uF	20%	50V
C572	1-126-163-11	ELECT	4.7uF	20%	50V
C573	1-110-501-11	CERAMIC CHIP	0.33uF	10%	16V
C574	1-124-261-00	ELECT	10uF	20%	50V
C575	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C576	1-124-584-00	ELECT	100uF	20%	10V
C577	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C578	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C620	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C621	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C622	1-128-131-11	ELECT	22uF	20%	50V
C623	1-124-589-11	ELECT	47uF	20%	16V
C624	1-124-589-11	ELECT	47uF	20%	16V
C625	1-124-589-11	ELECT	47uF	20%	16V
C626	1-128-131-11	ELECT	22uF	20%	50V
C627	1-128-131-11	ELECT	22uF	20%	50V
C628	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C629	1-128-131-11	ELECT	22uF	20%	50V
C701	1-104-664-11	ELECT	47uF	20%	16V
C706	1-126-963-11	ELECT	4.7uF	20%	50V
C707	1-164-161-11	CERAMIC CHIP	0.0022uF	10%	100V
C709	1-126-933-11	ELECT	100uF	20%	16V
C710	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C712	1-126-933-11	ELECT	100uF	20%	16V
C830	1-164-232-11	CERAMIC CHIP	0.01uF		50V (M91HF/999HF)
C832	1-163-251-11	CERAMIC CHIP	100PF	5%	50V (M91HF/999HF)
C833	1-163-121-00	CERAMIC CHIP	150PF	5%	50V (M91HF/999HF)
C834	1-163-245-11	CERAMIC CHIP	56PF	5%	50V (M91HF/999HF)
C835	1-163-038-00	CERAMIC CHIP	0.1uF		25V (M91HF/999HF)
C836	1-124-589-11	ELECT	47uF	20%	16V (M91HF/999HF)
C837	1-163-038-00	CERAMIC CHIP	0.1uF		25V (M91HF/999HF)
C913	1-163-011-11	CERAMIC CHIP	0.0015uF	10%	50V (M91HF/999HF)
C932	1-164-232-11	CERAMIC CHIP	0.01uF		50V (M91HF/999HF)
C933	1-124-589-11	ELECT	47uF	20%	16V (M91HF/999HF)
C934	1-104-697-11	FILM	0.047uF	5%	100V (M91HF/999HF)
C980	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C981	1-104-664-11	ELECT	47uF	20%	16V
C982	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C983	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C984	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C985	1-163-017-00	CERAMIC CHIP	0.0047uF	5%	50V
C986	1-163-038-00	CERAMIC CHIP	0.1uF		25V

< CONNECTOR >

	Ref. No.	Part No.	Description	Remarks
	CN101	1-779-724-11	CONNECTOR, BOARD TO BOARD 5P	
	CN102	1-779-723-11	CONNECTOR, BOARD TO BOARD 9P	
*	CN103	1-766-716-11	CONNECTOR, BOARD TO BOARD 3P	
	CN260	1-766-986-11	CONNECTOR, FFC/FPC 13P	
	CN261	1-573-844-11	CONNECTOR, BOARD TO BOARD 12P	
	CN262	1-778-226-21	CONNECTOR, BOARD TO BOARD 6P	
*	CN270	1-560-892-00	PIN, CONNECTOR 4P	
*	CN301	1-506-471-11	PIN, CONNECTOR 6P	
	CN302	1-506-468-11	PIN, CONNECTOR 3P	
	CN303	1-506-470-11	PIN, CONNECTOR 5P	
*	CN304	1-506-475-11	PIN, CONNECTOR 10P (M91HF)	
	CN461	1-784-510-11	CONNECTOR, FFC/FPC 31P	
	CN462	1-784-494-11	CONNECTOR, FFC/FPC 15P	
	CN464	1-770-594-21	CONNECTOR, BOARD TO BOARD 5P	(M11HF/M91HF)
	CN466	1-506-469-11	PIN, CONNECTOR 4P	
	CN467	1-770-010-21	CONNECTOR, BOARD TO BOARD 4P	(M11HF/M91HF)
	CN603	1-569-338-11	CONNECTOR, BOARD TO BOARD 19P	

< JACK >

Ref. No.	Part No.	Description
CNJ980	1-779-013-11	JACK, MINIATURE (CONTROL S IN)
CNJ981	1-784-598-11	JACK (CONTROL S OUT)

< DIODE >

Ref. No.	Part No.	Description
D103	8-719-048-26	DIODE GL528V1
D107	8-719-911-19	DIODE 1SS119-25TD
D109	8-719-200-82	DIODE MPG06D-6052PKG3
D140	8-719-109-84	DIODE RD5.1ES-T1B1
D161	8-719-200-82	DIODE MPG06D-6052PKG3
D301	8-719-109-84	DIODE RD5.1ES-T1B1
D301	8-719-109-85	DIODE RD5.1ES-T1B2
D420	8-719-110-03	DIODE RD7.5ES-T1B2
D462	8-719-200-82	DIODE MPG06D-6052PKG3
D463	8-719-200-82	DIODE MPG06D-6052PKG3

Ref. No.	Part No.	Description	Remarks
D562	8-719-109-74	DIODE RD4.3ES-T1B	
D611	8-719-911-19	DIODE 1SS119-25TD	
D612	8-719-109-85	DIODE RD5.1ES-T1B2	
D614	8-719-911-19	DIODE 1SS119-25TD	
D615	8-719-022-97	DIODE D2S4MF	
D702	8-719-150-92	DIODE RD33ES-T1B2	
D702	8-719-150-92	DIODE RD33ES-T1B3	
D980	8-719-110-08	DIODE RD8.2ES-T1B	
D981	8-719-110-08	DIODE RD8.2ES-T1B	
D982	8-719-911-19	DIODE 1SS119-25TD	
D983	8-719-110-08	DIODE RD8.2ES-T1B	
D984	8-719-110-08	DIODE RD8.2ES-T1B	
		< IC >	
IC100	8-759-702-02	IC NJM062M-TE2	
IC101	8-759-481-46	IC LB1943	
IC161	8-752-907-17	IC CXP88452-011Q	
IC201	8-759-581-54	IC LA71051M-MPB	
IC260	8-759-564-36	IC LA70011	
IC261	8-759-432-78	IC MM1111XFBE (M91HF)	
IC331	8-759-499-30	IC BA7755AF-E2	
IC360	8-759-559-37	IC TDA9605H/N1,557	
IC460	8-752-908-94	IC CXP82960-077Q (999HF)	
IC460	8-752-908-95	IC CXP82960-078Q (M11HF)	
IC460	8-752-908-96	IC CXP82960-079Q (M91HF)	
IC462	8-759-573-21	IC M24C16-WMN6T	
IC463	8-759-248-87	IC MM1256XF-BE	
IC570	8-759-566-07	IC LA7277M-TLM	
IC601	8-759-438-18	IC PQ12RD08	
IC980	8-759-356-27	IC NJM2129M-TE2	
		< JUMPER RESISTOR >	
JR001	1-216-295-00	METAL CHIP 0 5% 1/10W	
JR002	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR003	1-216-295-00	METAL CHIP 0 5% 1/10W	
JR004	1-216-295-00	METAL CHIP 0 5% 1/10W	
JR005	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR006	1-216-295-00	METAL CHIP 0 5% 1/10W	
JR007	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR008	1-216-295-00	METAL CHIP 0 5% 1/10W	
JR009	1-216-295-00	METAL CHIP 0 5% 1/10W	
JR010	1-216-295-00	METAL CHIP 0 5% 1/10W	
JR011	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR012	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR013	1-216-295-00	METAL CHIP 0 5% 1/10W	
JR014	1-216-295-00	METAL CHIP 0 5% 1/10W	
JR015	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR016	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR017	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR018	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR019	1-216-295-00	METAL CHIP 0 5% 1/10W	
JR020	1-216-295-00	METAL CHIP 0 5% 1/10W	
JR021	1-216-295-00	METAL CHIP 0 5% 1/10W	
JR022	1-216-295-00	METAL CHIP 0 5% 1/10W	
JR023	1-216-295-00	METAL CHIP 0 5% 1/10W	
JR024	1-216-295-00	METAL CHIP 0 5% 1/10W	
JR025	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR026	1-216-295-00	METAL CHIP 0 5% 1/10W	
JR027	1-216-295-00	METAL CHIP 0 5% 1/10W	
JR028	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR029	1-216-295-00	METAL CHIP 0 5% 1/10W	
JR030	1-216-295-00	METAL CHIP 0 5% 1/10W	
JR031	1-216-295-00	METAL CHIP 0 5% 1/10W	
JR032	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR033	1-216-295-00	METAL CHIP 0 5% 1/10W	
JR034	1-216-295-00	METAL CHIP 0 5% 1/10W	
JR035	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR036	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR037	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR038	1-216-295-00	METAL CHIP 0 5% 1/10W	
JR039	1-216-295-00	METAL CHIP 0 5% 1/10W	
JR040	1-216-295-00	METAL CHIP 0 5% 1/10W	
JR041	1-216-295-00	METAL CHIP 0 5% 1/10W	
JR042	1-216-295-00	METAL CHIP 0 5% 1/10W	
JR043	1-216-295-00	METAL CHIP 0 5% 1/10W	
JR044	1-216-295-00	METAL CHIP 0 5% 1/10W	
JR045	1-216-295-00	METAL CHIP 0 5% 1/10W	
JR046	1-216-295-00	METAL CHIP 0 5% 1/10W	
JR047	1-216-295-00	METAL CHIP 0 5% 1/10W	
JR048	1-216-295-00	METAL CHIP 0 5% 1/10W	
JR049	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR050	1-216-295-00	METAL CHIP 0 5% 1/10W	
JR051	1-216-295-00	METAL CHIP 0 5% 1/10W	
JR052	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR053	1-216-295-00	METAL CHIP 0 5% 1/10W	
JR054	1-216-295-00	METAL CHIP 0 5% 1/10W	
JR055	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR057	1-216-295-00	METAL CHIP 0 5% 1/10W	
JR058	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR059	1-216-295-00	METAL CHIP 0 5% 1/10W	
JR060	1-216-295-00	METAL CHIP 0 5% 1/10W	
JR061	1-216-295-00	METAL CHIP 0 5% 1/10W	
JR062	1-216-295-00	METAL CHIP 0 5% 1/10W	
JR063	1-216-295-00	METAL CHIP 0 5% 1/10W	
JR064	1-216-295-00	METAL CHIP 0 5% 1/10W	
JR065	1-216-295-00	METAL CHIP 0 5% 1/10W	
JR066	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR067	1-216-295-00	METAL CHIP 0 5% 1/10W	
JR068	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR069	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR070	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR071	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR072	1-216-295-00	METAL CHIP 0 5% 1/10W	
JR073	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR074	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR075	1-216-295-00	METAL CHIP 0 5% 1/10W	
JR076	1-216-295-00	METAL CHIP 0 5% 1/10W	
JR079	1-216-295-00	METAL CHIP 0 5% 1/10W	
JR080	1-216-295-00	METAL CHIP 0 5% 1/10W	
JR081	1-216-295-00	METAL CHIP 0 5% 1/10W	
JR082	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR083	1-216-296-00	METAL CHIP 0 5% 1/8W	

Ref. No.	Part No.	Description			Remarks
JR084	1-216-295-00	METAL CHIP	0	5%	1/10W
JS146	1-216-295-00	METAL CHIP	0	5%	1/10W
JS330	1-216-295-00	METAL CHIP	0	5%	1/10W (M11HF)
JS331	1-216-295-00	METAL CHIP	0	5%	1/10W (M91HF/999HF)
JS609	1-216-295-00	METAL CHIP	0	5%	1/10W (M91HF/999HF)
JS703	1-216-295-00	METAL CHIP	0	5%	1/10W
		< COIL >			
L101	1-414-930-21	INDUCTOR	2.2uH		
L140	1-414-934-21	INDUCTOR	10uH		
L160	1-414-934-21	INDUCTOR	10uH		
L201	1-414-946-21	INDUCTOR	39uH		
L202	1-414-940-21	INDUCTOR	100uH		
L203	1-414-940-21	INDUCTOR	100uH		
L204	1-414-940-21	INDUCTOR	100uH		
L205	1-414-940-21	INDUCTOR	100uH		
L206	1-414-940-21	INDUCTOR	100uH		
L208	1-414-932-21	INDUCTOR	4.7uH		
L260	1-414-934-21	INDUCTOR	10uH (M91HF/999HF)		
L261	1-414-936-21	INDUCTOR	22uH (M91HF)		
L264	1-414-934-21	INDUCTOR	10uH (M91HF/999HF)		
L270	1-414-940-21	INDUCTOR	100uH		
L328	1-410-071-11	INDUCTOR	10mH		
L360	1-414-940-21	INDUCTOR	100uH		
L460	1-414-934-21	INDUCTOR	10uH		
L561	1-414-940-21	INDUCTOR	100uH		
L570	1-414-940-21	INDUCTOR	100uH		
L604	1-410-519-11	INDUCTOR	68uH		
L605	1-414-930-21	INDUCTOR	2.2uH		
L606	1-414-934-21	INDUCTOR	10uH		
L607	1-414-930-21	INDUCTOR	2.2uH		
L703	1-414-930-21	INDUCTOR	2.2uH		
L704	1-414-936-21	INDUCTOR	22uH		
L830	1-414-933-21	INDUCTOR	6.8uH (M91HF/999HF)		
L831	1-414-940-21	INDUCTOR	100uH (M91HF/999HF)		
L931	1-410-687-11	INDUCTOR	1.2mH (M91HF/999HF)		
		< PHOTO INTERRUPTER >			
PH101	8-749-015-86	PHOTO INTERRUPTER GP3S120S			
PH102	8-749-015-86	PHOTO INTERRUPTER GP3S120S			
		< IC LINK >			
⚠PS101	1-533-586-21	LINK, IC (315mA)			
⚠PS331	1-533-586-21	LINK, IC (315mA)(M91HF/999HF)			
⚠PS600	1-532-675-91	LINK, IC (ICP-N38 1.5A)			
⚠PS602	1-532-675-91	LINK, IC (ICP-N38 1.5A)(M91HF)			
		< TRANSISTOR >			
Q101	8-729-043-84	TRANSISTOR	PT380F3		
Q101	8-729-047-02	TRANSISTOR	RPT-37PBT32L		
Q102	8-729-043-84	TRANSISTOR	PT380F3		
Q102	8-729-047-02	TRANSISTOR	RPT-37PBT32L		
Q103	8-729-281-53	TRANSISTOR	2SC1815GR-TPE2		
Q140	8-729-421-22	TRANSISTOR	MUN2211T1		
Q141	8-729-230-49	TRANSISTOR	2SC2712Y-TE85L		
Q142	8-729-421-19	TRANSISTOR	MUN2213T1		
Q201	8-729-230-49	TRANSISTOR	2SC2712Y-TE85L		
Q202	8-729-230-49	TRANSISTOR	2SC2712Y-TE85L		

Ref. No.	Part No.	Description		Remarks
Q203	8-729-216-21	TRANSISTOR	2SA1162Y-TE85L	
Q302	8-729-804-41	TRANSISTOR	2SB1122-ST-TD	
Q303	8-729-821-15	TRANSISTOR	2SD1620-TD	
Q380	8-729-216-21	TRANSISTOR	2SA1162Y-TE85L	
Q381	8-729-230-49	TRANSISTOR	2SC2712Y-TE85L	
Q382	8-729-230-49	TRANSISTOR	2SC2712Y-TE85L	
Q561	8-729-010-05	TRANSISTOR	MSB709-RT1	
Q603	8-729-018-99	TRANSISTOR	2SD2394-F	
Q604	8-729-010-29	TRANSISTOR	MSD601-RST1	
Q605	8-729-047-92	TRANSISTOR	2SB1398-Q(TA).S0	
Q606	8-729-119-78	TRANSISTOR	2SC3311A-RTA	
Q607	8-729-119-76	TRANSISTOR	2SA1309A-QRSTA	
Q608	8-729-010-29	TRANSISTOR	MSD601-RST1	
Q609	8-729-106-68	TRANSISTOR	2SD1664-T100-R	
Q830	8-729-216-22	TRANSISTOR	2SA812-T1M5	(M91HF/999HF)
Q831	8-729-216-22	TRANSISTOR	2SA812-T1M5	(M91HF/999HF)
Q832	8-729-421-19	TRANSISTOR	MUN2213T1 (M91HF/999HF)	
Q833	8-729-804-41	TRANSISTOR	2SB1122-ST-TD	(M91HF/999HF)
Q834	8-729-421-19	TRANSISTOR	MUN2213T1 (M91HF/999HF)	
Q931	8-729-012-31	TRANSISTOR	2SC4040-TL2-Q	(M91HF/999HF)
Q932	8-729-900-51	TRANSISTOR	UN2115-QRS(TX)	(M91HF/999HF)
		< RESISTOR >		

R101	1-249-413-11	CARBON	470	5%	1/4W F
R102	1-216-077-00	METAL CHIP	15K	5%	1/10W
R103	1-249-431-11	CARBON	15K	5%	1/4W
R104	1-249-435-11	CARBON	33K	5%	1/4W
R105	1-216-085-00	METAL CHIP	33K	5%	1/10W
R106	1-249-400-11	CARBON	39	5%	1/4W F
R107	1-249-400-11	CARBON	39	5%	1/4W F
R108	1-249-421-11	CARBON	2.2K	5%	1/4W F
R109	1-216-041-00	METAL CHIP	470	5%	1/10W
R110	1-216-041-00	METAL CHIP	470	5%	1/10W
R111	1-216-041-00	METAL CHIP	470	5%	1/10W
R112	1-216-049-00	METAL CHIP	1K	5%	1/10W
R113	1-216-097-91	RES,CHIP	100K	5%	1/10W
R118	1-216-089-00	METAL CHIP	47K	5%	1/10W
R119	1-216-077-00	METAL CHIP	15K	5%	1/10W
R124	1-249-421-11	CARBON	2.2K	5%	1/4W F
R125	1-249-421-11	CARBON	2.2K	5%	1/4W F
R126	1-247-885-00	CARBON	180K	5%	1/4W
R127	1-249-429-11	CARBON	10K	5%	1/4W
R128	1-249-425-11	CARBON	4.7K	5%	1/4W F
R129	1-216-073-00	METAL CHIP	10K	5%	1/10W
R130	1-216-073-00	METAL CHIP	10K	5%	1/10W
R131	1-208-806-11	RES,CHIP	10K	0.50%	1/10W
R132	1-208-806-11	RES,CHIP	10K	0.50%	1/10W
R133	1-249-436-11	CARBON	39K	5%	1/4W

Note :
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Note :
Les composants identifiés par une marque ⚠ sont critiques pour la sécurité.
Ne les remplacer que par une pièce portant le numéro spécifié.

Ref. No.	Part No.	Description			Remarks
R140	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R141	1-249-395-11	CARBON	15	5%	1/4W F
R142	1-249-395-11	CARBON	15	5%	1/4W F
R143	1-249-395-11	CARBON	15	5%	1/4W F
R144	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R158	1-216-049-00	METAL CHIP	1K	5%	1/10W
R159	1-216-049-00	METAL CHIP	1K	5%	1/10W
R160	1-216-077-00	METAL CHIP	15K	5%	1/10W
R161	1-216-073-00	METAL CHIP	10K	5%	1/10W
R163	1-216-073-00	METAL CHIP	10K	5%	1/10W
R164	1-216-073-00	METAL CHIP	10K	5%	1/10W
R165	1-216-295-00	METAL CHIP	0	5%	1/10W
R166	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R167	1-216-097-91	RES,CHIP	100K	5%	1/10W
R168	1-249-417-11	CARBON	1K	5%	1/4W F
R169	1-216-073-00	METAL CHIP	10K	5%	1/10W
R170	1-216-073-00	METAL CHIP	10K	5%	1/10W
R201	1-216-037-00	METAL CHIP	330	5%	1/10W
R202	1-216-047-91	RES,CHIP	820	5%	1/10W
R203	1-216-037-00	METAL CHIP	330	5%	1/10W
R204	1-216-061-91	RES,CHIP	3.3K	5%	1/10W
R205	1-208-830-11	RES,CHIP	100K	0.50%	1/10W
R208	1-216-295-00	METAL CHIP	0	5%	1/10W
R209	1-216-055-00	METAL CHIP	1.8K	5%	1/10W
R210	1-216-053-00	METAL CHIP	1.5K	5%	1/10W
R211	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R212	1-216-043-91	RES,CHIP	560	5%	1/10W
R213	1-216-049-00	METAL CHIP	1K	5%	1/10W
R214	1-216-053-00	METAL CHIP	1.5K	5%	1/10W
R215	1-216-071-00	METAL CHIP	8.2K	5%	1/10W
R216	1-216-055-00	METAL CHIP	1.8K	5%	1/10W
R218	1-216-295-00	METAL CHIP	0	5%	1/10W
R219	1-216-025-91	RES,CHIP	100	5%	1/10W
R220	1-216-295-00	METAL CHIP	0	5%	1/10W
R221	1-216-295-00	METAL CHIP	0	5%	1/10W
R224	1-216-089-00	METAL CHIP	47K	5%	1/10W
R225	1-216-295-00	METAL CHIP	0	5%	1/10W (M11HF/999HF)
R226	1-216-295-00	METAL CHIP	0	5%	1/10W
R230	1-216-295-00	METAL CHIP	0	5%	1/10W
R231	1-249-437-11	CARBON	47K	5%	1/4W
R232	1-249-437-11	CARBON	47K	5%	1/4W
R261	1-216-295-00	METAL CHIP	0	5%	1/10W (M91HF)
R270	1-216-041-00	METAL CHIP	470	5%	1/10W
R271	1-216-041-00	METAL CHIP	470	5%	1/10W
R272	1-208-788-11	RES,CHIP	1.8K	0.50%	1/10W
R273	1-216-295-00	METAL CHIP	0	5%	1/10W
R274	1-216-062-00	METAL CHIP	3.6K	5%	1/10W
R276	1-216-069-00	METAL CHIP	6.8K	5%	1/10W
R277	1-216-081-00	METAL CHIP	22K	5%	1/10W
R278	1-216-081-00	METAL CHIP	22K	5%	1/10W
R279	1-216-081-00	METAL CHIP	22K	5%	1/10W
R286	1-216-021-00	METAL CHIP	68	5%	1/10W
R301	1-216-067-00	METAL CHIP	5.6K	5%	1/10W
R302	1-216-093-91	RES,CHIP	68K	5%	1/10W
R305	1-216-129-00	METAL CHIP	2.2M	5%	1/10W

Ref. No.	Part No.	Description			Remarks
R309	1-216-043-91	RES,CHIP	560	5%	1/10W
R310	1-216-071-00	METAL CHIP	8.2K	5%	1/10W
R311	1-216-061-91	RES,CHIP	3.3K	5%	1/10W
R312	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R313	1-216-051-00	METAL CHIP	1.2K	5%	1/10W
R314	1-216-073-00	METAL CHIP	10K	5%	1/10W
R315	1-216-035-00	METAL CHIP	270	5%	1/10W
R316	1-216-109-00	METAL CHIP	330K	5%	1/10W
R317	1-216-071-00	METAL CHIP	8.2K	5%	1/10W
R318	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R319	1-216-033-00	METAL CHIP	220	5%	1/10W
R320	1-217-671-11	METAL CHIP	1	5%	1/10W
R321	1-216-067-00	METAL CHIP	5.6K	5%	1/10W (M91HF/999HF)
R321	1-216-063-91	RES,CHIP	3.9K	5%	1/10W (M11HF)
R322	1-216-017-91	RES,CHIP	47	5%	1/10W
R323	1-216-081-00	METAL CHIP	22K	5%	1/10W
R324	1-216-031-00	METAL CHIP	180	5%	1/10W
R325	1-216-075-00	METAL CHIP	12K	5%	1/10W
R326	1-216-079-00	METAL CHIP	18K	5%	1/10W
R327	1-216-033-00	METAL CHIP	220	5%	1/10W
R361	1-216-083-00	METAL CHIP	27K	5%	1/10W
R362	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R363	1-208-820-11	RES,CHIP	39K	0.50%	1/10W
R364	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R365	1-216-083-00	METAL CHIP	27K	5%	1/10W
R366	1-216-041-00	METAL CHIP	470	5%	1/10W
R368	1-216-079-00	METAL CHIP	18K	5%	1/10W
R369	1-216-133-00	METAL CHIP	3.3M	5%	1/10W
R370	1-216-295-00	METAL CHIP	0	5%	1/10W
R371	1-216-295-00	METAL CHIP	0	5%	1/10W
R372	1-216-073-00	METAL CHIP	10K	5%	1/10W
R373	1-216-295-00	METAL CHIP	0	5%	1/10W
R374	1-216-295-00	METAL CHIP	0	5%	1/10W
R375	1-216-025-91	RES,CHIP	100	5%	1/10W
R376	1-216-025-91	RES,CHIP	100	5%	1/10W
R377	1-216-295-00	METAL CHIP	0	5%	1/10W
R378	1-216-295-00	METAL CHIP	0	5%	1/10W
R380	1-216-073-00	METAL CHIP	10K	5%	1/10W
R381	1-216-061-91	RES,CHIP	3.3K	5%	1/10W
R382	1-216-049-00	METAL CHIP	1K	5%	1/10W
R383	1-216-049-00	METAL CHIP	1K	5%	1/10W
R387	1-216-295-00	METAL CHIP	0	5%	1/10W
R388	1-216-295-00	METAL CHIP	0	5%	1/10W
R412	1-216-073-00	METAL CHIP	10K	5%	1/10W
R413	1-216-095-00	METAL CHIP	82K	5%	1/10W
R415	1-216-073-00	METAL CHIP	10K	5%	1/10W
R416	1-216-073-00	METAL CHIP	10K	5%	1/10W
R417	1-216-095-00	METAL CHIP	82K	5%	1/10W
R420	1-216-069-00	METAL CHIP	6.8K	5%	1/10W
R462	1-216-041-00	METAL CHIP	470	5%	1/10W
R463	1-216-089-00	METAL CHIP	47K	5%	1/10W
R464	1-216-041-00	METAL CHIP	470	5%	1/10W
R465	1-216-041-00	METAL CHIP	470	5%	1/10W
R466	1-216-073-00	METAL CHIP	10K	5%	1/10W
R467	1-216-073-00	METAL CHIP	10K	5%	1/10W

Ref. No.	Part No.	Description			Remarks
R468	1-216-113-00	METAL CHIP	470K	5%	1/10W
R469	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R470	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R471	1-216-025-91	RES,CHIP	100	5%	1/10W
R472	1-216-025-91	RES,CHIP	100	5%	1/10W
R474	1-216-113-00	METAL CHIP	470K	5%	1/10W
R475	1-216-295-00	METAL CHIP	0	5%	1/10W
R476	1-216-295-00	METAL CHIP	0	5%	1/10W
R477	1-216-095-00	METAL CHIP	82K	5%	1/10W
R478	1-216-113-00	METAL CHIP	470K	5%	1/10W
R479	1-216-049-00	METAL CHIP	1K	5%	1/10W
R480	1-216-049-00	METAL CHIP	1K	5%	1/10W
R481	1-216-049-00	METAL CHIP	1K	5%	1/10W
R482	1-216-049-00	METAL CHIP	1K	5%	1/10W
R483	1-216-073-00	METAL CHIP	10K	5%	1/10W
R484	1-216-073-00	METAL CHIP	10K	5%	1/10W
R485	1-216-113-00	METAL CHIP	470K	5%	1/10W
R486	1-216-081-00	METAL CHIP	22K	5%	1/10W (M11HF/M91HF)
R488	1-216-025-91	RES,CHIP	100	5%	1/10W (M11HF/M91HF)
R490	1-216-025-91	RES,CHIP	100	5%	1/10W (M11HF/M91HF)
R492	1-216-295-00	METAL CHIP	0	5%	1/10W (M11HF/M91HF)
R561	1-216-037-00	METAL CHIP	330	5%	1/10W
R562	1-249-407-11	CARBON	150	5%	1/4W F
R563	1-249-408-11	CARBON	180	5%	1/4W F
R564	1-216-021-00	METAL CHIP	68	5%	1/10W
R565	1-216-022-00	METAL CHIP	75	5%	1/10W
R570	1-216-675-91	METAL CHIP	10K	0.50%	1/10W
R571	1-216-041-00	METAL CHIP	470	5%	1/10W
R572	1-216-041-00	METAL CHIP	470	5%	1/10W
R573	1-216-071-00	METAL CHIP	8.2K	5%	1/10W
R574	1-216-049-00	METAL CHIP	1K	5%	1/10W
R575	1-216-067-00	METAL CHIP	5.6K	5%	1/10W
R617	1-249-417-11	CARBON	1K	5%	1/4W F
R621	1-216-089-00	METAL CHIP	47K	5%	1/10W
R622	1-216-061-91	RES,CHIP	3.3K	5%	1/10W
R623	1-216-061-91	RES,CHIP	3.3K	5%	1/10W
R624	1-215-888-00	METAL OXIDE	220	5%	2W F
R625	1-249-429-11	CARBON	10K	5%	1/4W
R626	1-249-417-11	CARBON	1K	5%	1/4W F
R627	1-247-815-91	CARBON	220	5%	1/4W
R628	1-247-815-91	CARBON	220	5%	1/4W
R630	1-215-872-11	METAL OXIDE	3.3K	5%	1W F
R631	1-247-863-91	CARBON	22K	5%	1/4W
R632	1-216-097-91	RES,CHIP	100K	5%	1/10W
R633	1-216-061-91	RES,CHIP	3.3K	5%	1/10W
R701	1-249-417-11	CARBON	1K	5%	1/4W F
R702	1-216-061-91	RES,CHIP	3.3K	5%	1/10W
R703	1-216-039-00	METAL CHIP	390	5%	1/10W
R704	1-216-043-91	RES,CHIP	560	5%	1/10W
⚠R705	1-219-105-91	FUSIBLE	560	5%	1/4W F
R706	1-216-113-00	METAL CHIP	470K	5%	1/10W
R707	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R709	1-216-049-00	METAL CHIP	1K	5%	1/10W
R710	1-216-049-00	METAL CHIP	1K	5%	1/10W
R711	1-216-049-00	METAL CHIP	1K	5%	1/10W
R712	1-216-295-00	METAL CHIP	0	5%	1/10W

Ref. No.	Part No.	Description			Remarks
R731	1-216-049-00	METAL CHIP	1K	5%	1/10W
R732	1-216-049-00	METAL CHIP	1K	5%	1/10W
R733	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R734	1-216-049-00	METAL CHIP	1K	5%	1/10W
R735	1-216-049-00	METAL CHIP	1K	5%	1/10W
R737	1-216-081-00	METAL CHIP	22K	5%	1/10W
R738	1-216-081-00	METAL CHIP	22K	5%	1/10W
R830	1-216-011-00	METAL CHIP	27	5%	1/10W (M91HF/999HF)
R831	1-216-041-00	METAL CHIP	470	5%	1/10W (M91HF/999HF)
R832	1-208-787-11	RES,CHIP	1.6K	0.50%	1/10W (M91HF/999HF)
R833	1-216-095-00	METAL CHIP	82K	5%	1/10W (M91HF/999HF)
R834	1-216-089-00	METAL CHIP	47K	5%	1/10W (M91HF/999HF)
R835	1-216-689-11	METAL CHIP	39K	0.5%	1/10W (M91HF/999HF)
R836	1-216-061-91	RES,CHIP	3.3K	5%	1/10W (M91HF/999HF)
R837	1-216-073-00	METAL CHIP	10K	5%	1/10W (M91HF/999HF)
R932	1-216-083-00	METAL CHIP	27K	5%	1/10W (M91HF/999HF)
R933	1-216-003-11	RES,CHIP	12	5%	1/10W (M91HF/999HF)
R980	1-216-049-00	METAL CHIP	1K	5%	1/10W
R981	1-216-295-00	METAL CHIP	0	5%	1/10W
		< JACK >			
RCJ561	1-779-011-11	JACK, PIN 6P (LINE IN/OUT (VIDEO, AUDIO L/R))			
		< SWITCH >			
S101	1-762-108-11	SWITCH, PUSH (1 KEY)(REC PROOF)			
S102	1-771-155-11	SWITCH, ROTARY (MODE)			
S701	1-571-588-11	SWITCH, SLIDE (RF CH3/CH4)			
		< TRANSFORMER >			
T301	1-433-479-11	TRANSFORMER, BIAS OSCILLATION (M11HF)			
T301	1-433-538-11	TRANSFORMER, BIAS OSCILLATION (M91HF/999HF)			
T931	1-433-537-11	TRANSFORMER, BIAS OSCILLATION (M91HF/999HF)			
		< TUNER >			
TU701	8-598-473-00	TUNER, FSS BTF-MA431			
		< VIBRATOR >			
X160	1-760-494-11	VIBRATOR, CRYSTAL (16MHz)			
X201	1-577-380-11	VIBRATOR, CRYSTAL (3.579545MHz)			
X460	1-760-494-11	VIBRATOR, CRYSTAL (16MHz)			
X461	1-579-463-11	VIBRATOR, CRYSTAL (32.768MHz)			

Note :
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Note :
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Ne les remplacer que par une pièce portant le numéro spécifié.

ML-18

Ref. No.	Part No.	Description			Remarks
*	A-6791-898-A	ML-18 BOARD, COMPLETE (M11HF/M91HF)			
		**********			
					(Ref.No.:2000 series)
		< CAPACITOR >			
C002	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C005	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C006	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C007	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C008	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C009	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C010	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C011	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C012	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C013	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C015	1-163-113-00	CERAMIC CHIP	68PF	5%	50V
C016	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C017	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C018	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C020	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C021	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C022	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C023	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C024	1-124-234-00	ELECT	22uF	20%	16V
C026	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C027	1-124-589-11	ELECT	47uF	20%	16V
C029	1-124-234-00	ELECT	22uF	20%	16V
C030	1-163-113-00	CERAMIC CHIP	68PF	5%	50V
C032	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C034	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C035	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C036	1-128-057-11	ELECT	330uF	20%	6.3V
C037	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C038	1-163-241-11	CERAMIC CHIP	39PF	5%	50V
C039	1-163-235-11	CERAMIC CHIP	22PF	5%	50V
C041	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C043	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C045	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C046	1-124-234-00	ELECT	22uF	20%	16V
C047	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C048	1-124-234-00	ELECT	22uF	20%	16V
C052	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
		< CONNECTOR >			
CN001	1-506-482-11	PIN, CONNECTOR 3P			
CN002	1-506-482-11	PIN, CONNECTOR 3P			
CN003	1-770-593-41	CONNECTOR, BOARD TO BOARD 5P			
CN005	1-506-482-11	PIN, CONNECTOR 3P			
CN006	1-770-011-41	CONNECTOR, BOARD TO BOARD 4P			
		< DIODE >			
D001	8-719-073-01	DIODE MA111-TX			
D002	8-719-073-01	DIODE MA111-TX			
D003	8-719-073-01	DIODE MA111-TX			
D004	8-719-073-01	DIODE MA111-TX			
D005	8-719-073-01	DIODE MA111-TX			

Ref. No.	Part No.	Description			Remarks
D008	8-719-073-01	DIODE MA111-TX			
		< FERRITE BEAD >			
FB001	1-414-235-22	INDUCTOR CHIP	0UH		
FB002	1-414-235-22	INDUCTOR CHIP	0UH		
FB004	1-414-235-22	INDUCTOR CHIP	0UH		
FB006	1-414-233-22	INDUCTOR CHIP	0UH		
FB007	1-414-233-22	INDUCTOR CHIP	0UH		
FB008	1-414-233-22	INDUCTOR CHIP	0UH		
FB009	1-414-233-22	INDUCTOR CHIP	0UH		
FB010	1-414-234-22	INDUCTOR CHIP	0UH		
FB011	1-414-234-22	INDUCTOR CHIP	0UH		
FB012	1-414-234-22	INDUCTOR CHIP	0UH		
FB014	1-414-234-22	INDUCTOR CHIP	0UH		
FB020	1-414-235-22	INDUCTOR CHIP	0UH		
FB021	1-414-235-22	INDUCTOR CHIP	0UH		
FB022	1-414-235-22	INDUCTOR CHIP	0UH		
FB023	1-414-235-22	INDUCTOR CHIP	0UH		
FB024	1-414-235-22	INDUCTOR CHIP	0UH		
		< IC >			
IC001	8-759-100-93	IC uPC393G2-E2			
IC002	8-759-587-89	IC CXD8753AQ			
IC003	8-752-902-45	IC CXP84632-041Q			
IC004	8-759-518-23	IC 24LC04BT/SN			
IC004	8-759-575-71	IC M24C04-WMN6T			
		< JAMPER RESISTOR >			
JS001	1-216-296-00	METAL CHIP	0	5%	1/8W
		< COIL >			
L002	1-414-934-21	INDUCTOR	10uH		
L003	1-414-934-21	INDUCTOR	10uH		
L004	1-414-938-21	INDUCTOR	47uH		
L006	1-414-934-21	INDUCTOR	10uH		
L007	1-414-934-21	INDUCTOR	10uH		
L008	1-414-940-21	INDUCTOR	100uH		
L009	1-414-936-21	INDUCTOR	22uH		
L010	1-414-936-21	INDUCTOR	22uH		
		< IC LINK >			
⚠ PS001	1-533-901-21	LINK, IC (125mA)			
		< TRANSISTOR >			
Q001	8-729-044-60	TRANSISTOR	2SC3383-T-AA		
Q002	8-729-044-60	TRANSISTOR	2SC3383-T-AA		
Q003	8-729-421-19	TRANSISTOR	MUN2213T1		
Q004	8-729-010-25	TRANSISTOR	MSD601-RT1		
Q005	8-729-010-25	TRANSISTOR	MSD601-RT1		
Q006	8-729-010-25	TRANSISTOR	MSD601-RT1		
Q007	8-729-010-25	TRANSISTOR	MSD601-RT1		
Q008	8-729-044-60	TRANSISTOR	2SC3383-T-AA		
Q009	8-729-421-19	TRANSISTOR	MUN2213T1		
Q010	8-729-421-19	TRANSISTOR	MUN2213T1		

Note :
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Note :
Les composants identifiés par une marque ⚠ sont critiques pour la sécurité.
Ne les remplacer que par une pièce portant le numéro spécifié.

Ref. No.	Part No.	Description			Remarks
Q011	8-729-044-60	TRANSISTOR	2SC3383-T-AA		
Q012	8-729-421-19	TRANSISTOR	MUN2213T1		
Q015	8-729-421-19	TRANSISTOR	MUN2213T1		
Q016	8-729-010-05	TRANSISTOR	MSB709-RT1		
Q017	8-729-010-05	TRANSISTOR	MSB709-RT1		
Q018	8-729-010-05	TRANSISTOR	MSB709-RT1		
Q019	8-729-010-05	TRANSISTOR	MSB709-RT1		
		< RESISTOR >			
R002	1-249-402-11	CARBON	56	5%	1/4W F
R004	1-216-049-00	METAL CHIP	1K	5%	1/10W
R005	1-216-049-00	METAL CHIP	1K	5%	1/10W
R007	1-249-398-11	CARBON	27	5%	1/4W F
R008	1-216-049-00	METAL CHIP	1K	5%	1/10W
R009	1-216-295-00	METAL CHIP	0	5%	1/10W
R010	1-216-049-00	METAL CHIP	1K	5%	1/10W
R011	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R012	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R013	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R014	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R015	1-216-025-91	RES,CHIP	100	5%	1/10W
R016	1-216-089-00	METAL CHIP	47K	5%	1/10W
R017	1-216-081-00	METAL CHIP	22K	5%	1/10W
R018	1-216-025-91	RES,CHIP	100	5%	1/10W
R019	1-216-089-00	METAL CHIP	47K	5%	1/10W
R020	1-216-081-00	METAL CHIP	22K	5%	1/10W
R022	1-216-049-00	METAL CHIP	1K	5%	1/10W
R023	1-216-017-91	RES,CHIP	47	5%	1/10W
R024	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R025	1-216-049-00	METAL CHIP	1K	5%	1/10W
R027	1-249-402-11	CARBON	56	5%	1/4W F
R030	1-216-017-91	RES,CHIP	47	5%	1/10W
R031	1-216-073-00	METAL CHIP	10K	5%	1/10W
R032	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R033	1-216-063-91	RES,CHIP	3.9K	5%	1/10W
R035	1-249-398-11	CARBON	27	5%	1/4W F
R036	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R037	1-216-295-00	METAL CHIP	0	5%	1/10W
R038	1-216-063-91	RES,CHIP	3.9K	5%	1/10W
R039	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R040	1-216-121-91	RES,CHIP	1M	5%	1/10W
R041	1-216-073-00	METAL CHIP	10K	5%	1/10W
R042	1-216-073-00	METAL CHIP	10K	5%	1/10W
R046	1-216-295-00	METAL CHIP	0	5%	1/10W
R048	1-216-089-00	METAL CHIP	47K	5%	1/10W
R051	1-216-045-00	METAL CHIP	680	5%	1/10W
R053	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R054	1-216-025-91	RES,CHIP	100	5%	1/10W
R057	1-216-025-91	RES,CHIP	100	5%	1/10W
R058	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R060	1-216-045-00	METAL CHIP	680	5%	1/10W
R061	1-216-045-00	METAL CHIP	680	5%	1/10W
R063	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R064	1-216-025-91	RES,CHIP	100	5%	1/10W
R067	1-216-025-91	RES,CHIP	100	5%	1/10W
R068	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R070	1-216-045-00	METAL CHIP	680	5%	1/10W
R071	1-216-041-00	METAL CHIP	470	5%	1/10W
R072	1-216-041-00	METAL CHIP	470	5%	1/10W
R073	1-216-041-00	METAL CHIP	470	5%	1/10W
R074	1-216-041-00	METAL CHIP	470	5%	1/10W
R075	1-216-041-00	METAL CHIP	470	5%	1/10W
R076	1-216-041-00	METAL CHIP	470	5%	1/10W
R077	1-216-041-00	METAL CHIP	470	5%	1/10W
R078	1-216-041-00	METAL CHIP	470	5%	1/10W
R079	1-216-041-00	METAL CHIP	470	5%	1/10W
R080	1-216-041-00	METAL CHIP	470	5%	1/10W
R081	1-216-089-00	METAL CHIP	47K	5%	1/10W
R082	1-216-089-00	METAL CHIP	47K	5%	1/10W
R083	1-216-043-91	RES,CHIP	560	5%	1/10W
R084	1-216-295-00	METAL CHIP	0	5%	1/10W
R085	1-216-295-00	METAL CHIP	0	5%	1/10W
R086	1-216-295-00	METAL CHIP	0	5%	1/10W
R087	1-216-295-00	METAL CHIP	0	5%	1/10W
R088	1-216-295-00	METAL CHIP	0	5%	1/10W
		< VIBRATOR >			
X001	1-767-914-21	VIBRATOR, CRYSTAL (13.56MHz)			
X002	1-760-995-21	VIBRATOR, CERAMIC (16MHz)			
*	A-6791-901-A	PD-111 BOARD, COMPLETE (M91HF)			
		**********			
					(Ref.No.:3000 series)
		< CAPACITOR >			
* C601	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C602	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C603	1-163-263-11	CERAMIC CHIP	330PF	5%	50V
C604	1-163-134-00	CERAMIC CHIP	510PF	5%	50V
C605	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C606	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C607	1-163-237-11	CERAMIC CHIP	27PF	5%	50V
C609	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C610	1-163-245-11	CERAMIC CHIP	56PF	5%	50V
C611	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C616	1-163-235-11	CERAMIC CHIP	22PF	5%	50V
C618	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C621	1-124-589-11	ELECT	47uF	20%	16V
* C622	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C624	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
		< CONNECTOR >			
* CN601	1-573-735-11	PIN, CONNECTOR 8P			
		< COIL >			
L601	1-412-953-11	INDUCTOR	15uH		
L602	1-412-062-11	INDUCTOR CHIP	47uH		
L603	1-412-952-11	INDUCTOR	12uH		
L604	1-412-945-11	INDUCTOR	3.3uH		
L605	1-412-944-11	INDUCTOR	2.7uH		
L606	1-412-944-11	INDUCTOR	2.7uH		

Ref. No.	Part No.	Description			Remarks
		< TRANSISTOR >			
Q600	8-729-122-63	TRANSISTOR	2SA1226-T1E3E4		
Q601	8-729-102-07	TRANSISTOR	2SC2223-T1F13F14		
Q602	8-729-122-63	TRANSISTOR	2SA1226-T1E3E4		
Q603	8-729-102-07	TRANSISTOR	2SC2223-T1F13F14		
Q604	8-729-120-28	TRANSISTOR	2SC1623-T1-L5L6		
Q605	8-729-102-07	TRANSISTOR	2SC2223-T1F13F14		
Q606	8-729-102-07	TRANSISTOR	2SC2223-T1F13F14		
Q607	8-729-102-07	TRANSISTOR	2SC2223-T1F13F14		
Q608	8-729-102-07	TRANSISTOR	2SC2223-T1F13F14		
		< RESISTOR >			
R601	1-216-073-00	METAL CHIP	10K	5%	1/10W
R602	1-216-029-00	METAL CHIP	150	5%	1/10W
R603	1-216-023-00	METAL CHIP	82	5%	1/10W
R604	1-216-033-00	METAL CHIP	220	5%	1/10W
R605	1-216-053-00	METAL CHIP	1.5K	5%	1/10W
R606	1-216-067-00	METAL CHIP	5.6K	5%	1/10W
R607	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R608	1-216-043-91	RES,CHIP	560	5%	1/10W
R609	1-216-037-00	METAL CHIP	330	5%	1/10W
R610	1-216-037-00	METAL CHIP	330	5%	1/10W
R611	1-216-078-00	RES,CHIP	16K	5%	1/10W
R612	1-216-075-00	METAL CHIP	12K	5%	1/10W
R613	1-216-045-00	METAL CHIP	680	5%	1/10W
R614	1-216-041-00	METAL CHIP	470	5%	1/10W
R615	1-216-033-00	METAL CHIP	220	5%	1/10W
R616	1-216-033-00	METAL CHIP	220	5%	1/10W
R617	1-216-045-00	METAL CHIP	680	5%	1/10W
R618	1-216-043-91	RES,CHIP	560	5%	1/10W
R619	1-216-077-00	METAL CHIP	15K	5%	1/10W
R620	1-216-069-00	METAL CHIP	6.8K	5%	1/10W
R621	1-216-059-00	METAL CHIP	2.7K	5%	1/10W
R622	1-216-045-00	METAL CHIP	680	5%	1/10W
R623	1-216-033-00	METAL CHIP	220	5%	1/10W
R624	1-216-039-00	METAL CHIP	390	5%	1/10W
R625	1-216-025-91	RES,CHIP	100	5%	1/10W
*	A-6791-900-A	RJ-83 BOARD, COMPLETE (M11HF)			
		**********			
		(Ref.No.:3000 series)			
		< CONNECTOR >			
CN001	1-506-468-11	PIN, CONNECTOR 3P			
		< JACK >			
CNJ001	1-784-598-11	JACK (CDP IN)			
		< DIODE >			
D001	8-719-073-03	DIODE MA8082-TX			

Ref. No.	Part No.	Description			Remarks
*	A-6791-899-A	VD-29 BOARD, COMPLETE			
		**********			
		(Ref.No.:2000 series)			
		< CAPACITOR >			
C501	1-164-489-11	CERAMIC CHIP	0.22uF	10%	16V
C502	1-124-589-11	ELECT	47uF	20%	16V
C503	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C504	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C505	1-126-157-11	ELECT	10uF	20%	16V
C506	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C507	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C508	1-163-237-11	CERAMIC CHIP	27PF	5%	50V
C509	1-164-505-11	CERAMIC CHIP	2.2uF		16V
C511	1-163-229-11	CERAMIC CHIP	12PF	5%	50V
C512	1-163-235-11	CERAMIC CHIP	22PF	5%	50V
C513	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C514	1-163-235-11	CERAMIC CHIP	22PF	5%	50V
C515	1-124-589-11	ELECT	47uF	20%	16V
C516	1-126-160-11	ELECT	1uF	20%	50V
C517	1-163-239-11	CERAMIC CHIP	33PF	5%	50V
C518	1-124-257-00	ELECT	2.2uF	20%	50V
C519	1-163-139-00	CERAMIC CHIP	820PF	5%	50V
C520	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C521	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C522	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C523	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C871	1-124-589-11	ELECT	47uF	20%	16V
C872	1-163-019-00	CERAMIC CHIP	0.0068uF	10%	50V
C873	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C874	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C875	1-164-346-11	CERAMIC CHIP	1uF		16V
C876	1-163-135-00	CERAMIC CHIP	560PF	5%	50V
C878	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C880	1-163-233-11	CERAMIC CHIP	18PF	5%	50V
C881	1-163-233-11	CERAMIC CHIP	18PF	5%	50V
		< CONNECTOR >			
CN501	1-764-864-41	CONNECTOR, BOARD TO BOARD 12P			
CN502	1-778-227-41	CONNECTOR, BOARD TO BOARD 6P			
		< DIODE >			
D502	8-719-073-01	DIODE MA111-TX			
D503	8-719-073-01	DIODE MA111-TX			
D504	8-719-073-01	DIODE MA111-TX			
		< IC >			
IC500	8-759-529-44	IC MB90089PF-G-209-BND-ER			
IC501	8-759-164-09	IC LA7218M-TE-R			
IC871	8-759-430-84	IC MC68HC05CCVFB-LSC86145FB			
		< JUMPER RESISTOR >			
JR500	1-216-296-00	METAL CHIP	0	5%	1/8W
JR501	1-216-296-00	METAL CHIP	0	5%	1/8W
JR502	1-216-296-00	METAL CHIP	0	5%	1/8W
JR503	1-216-296-00	METAL CHIP	0	5%	1/8W
JR504	1-216-296-00	METAL CHIP	0	5%	1/8W

Ref. No.	Part No.	Description			Remarks
JR505	1-216-296-00	METAL CHIP	0	5%	1/8W
JR506	1-216-296-00	METAL CHIP	0	5%	1/8W
JR507	1-216-296-00	METAL CHIP	0	5%	1/8W
JR508	1-216-296-00	METAL CHIP	0	5%	1/8W
JR509	1-216-296-00	METAL CHIP	0	5%	1/8W
JR510	1-216-296-00	METAL CHIP	0	5%	1/8W
JR511	1-216-296-00	METAL CHIP	0	5%	1/8W
		< COIL >			
L501	1-412-470-21	INDUCTOR	22uH		
L502	1-414-940-21	INDUCTOR	100uH		
L503	1-414-940-21	INDUCTOR	100uH		
L871	1-414-934-21	INDUCTOR	10uH		
		< TRANSISTOR >			
Q502	8-729-010-05	TRANSISTOR	MSB709-RT1		
Q503	8-729-010-05	TRANSISTOR	MSB709-RT1		
Q505	8-729-010-05	TRANSISTOR	MSB709-RT1		
Q871	8-729-010-05	TRANSISTOR	MSB709-RT1		
Q872	8-729-010-29	TRANSISTOR	MSD601-RST1		
Q873	8-729-010-29	TRANSISTOR	MSD601-RST1		
Q874	8-729-424-08	TRANSISTOR	MUN2111T1		
Q875	8-729-010-29	TRANSISTOR	MSD601-RST1		
		< RESISTOR >			
R502	1-216-033-00	METAL CHIP	220	5%	1/10W
R505	1-216-059-00	METAL CHIP	2.7K	5%	1/10W
R506	1-216-051-00	METAL CHIP	1.2K	5%	1/10W
R507	1-216-081-00	METAL CHIP	22K	5%	1/10W
R508	1-216-049-00	METAL CHIP	1K	5%	1/10W
R510	1-216-081-00	METAL CHIP	22K	5%	1/10W
R514	1-216-073-00	METAL CHIP	10K	5%	1/10W
R515	1-216-101-00	METAL CHIP	150K	5%	1/10W
R517	1-216-063-91	RES,CHIP	3.9K	5%	1/10W
R518	1-216-043-91	RES,CHIP	560	5%	1/10W
R519	1-216-043-91	RES,CHIP	560	5%	1/10W
R520	1-216-033-00	METAL CHIP	220	5%	1/10W
R521	1-216-073-00	METAL CHIP	10K	5%	1/10W
R522	1-216-073-00	METAL CHIP	10K	5%	1/10W
R523	1-216-073-00	METAL CHIP	10K	5%	1/10W
R871	1-216-073-00	METAL CHIP	10K	5%	1/10W
R872	1-216-025-91	RES,CHIP	100	5%	1/10W
R873	1-216-025-91	RES,CHIP	100	5%	1/10W
R874	1-216-025-91	RES,CHIP	100	5%	1/10W
R875	1-216-025-91	RES,CHIP	100	5%	1/10W
R876	1-216-081-00	METAL CHIP	22K	5%	1/10W
R877	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R878	1-216-073-00	METAL CHIP	10K	5%	1/10W
R879	1-216-049-00	METAL CHIP	1K	5%	1/10W
R880	1-216-073-00	METAL CHIP	10K	5%	1/10W
R881	1-216-043-91	RES,CHIP	560	5%	1/10W
R882	1-216-049-00	METAL CHIP	1K	5%	1/10W
R883	1-216-053-00	METAL CHIP	1.5K	5%	1/10W
R884	1-216-047-91	RES,CHIP	820	5%	1/10W
R885	1-216-025-91	RES,CHIP	100	5%	1/10W
R886	1-216-073-00	METAL CHIP	10K	5%	1/10W
R887	1-216-081-00	METAL CHIP	22K	5%	1/10W
R888	1-216-081-00	METAL CHIP	22K	5%	1/10W
R889	1-216-025-91	RES,CHIP	100	5%	1/10W
R890	1-216-049-00	METAL CHIP	1K	5%	1/10W

Ref. No.	Part No.	Description		Remarks
		< VIBRATOR >		
X500	1-577-381-11	VIBRATOR, CRYSTAL (14.31818MHz)		
X501	1-577-165-11	VIBLATOR, CERAMIC (500kHz)		
X871	1-577-133-21	VIBRATOR, CRYSTAL (8MHz)		
⚠	1-468-401-11	POWER BLOCK (SRV886UC)		
		**********		
				(Ref.No.;9000Series)
		< CAPACITOR >		
⚠C101	1-104-705-51	FILM	0,1µF	250V
⚠C102	1-104-705-51	FILM	0,1µF	250V
⚠C103	1-119-898-51	CERAMIC CHIP	470pF	250V
⚠C104	1-119-898-51	CERAMIC CHIP	470pF	250V
⚠C105	1-115-375-11	CERAMIC CHIP	1500pF	250V
C106	1-119-882-41	ELECT	120µF	200V
C107	1-126-963-11	ELECT	4,7µF	50V
C201	1-126-967-11	ELECT	47µF	50V
C202	1-111-039-11	ELECT	680µF	16V
C203	1-126-934-11	ELECT	220µF	16V
C204	1-115-763-11	ELECT	1200µF	16V
C205	1-126-925-11	ELECT	470µF	10V
C206	1-126-967-11	ELECT	47µF	50V
C207	1-126-925-11	ELECT	470µF	10V
C208	1-126-960-11	ELECT	1µF	50V
C301	1-111-089-11	ELECT	470µF	35V
C303	1-126-965-11	ELECT	22µF	50V
		< DIODE >		
D102	8-719-052-58	DIODE	PR1005	
D103	8-719-920-32	DIODE	ERA15-02	
D104	8-719-109-61	DIODE	MTZJ3.0	
D105	8-719-911-19	DIODE	MA165	
D106	8-719-904-05	DIODE	1N4005	
D107	8-719-904-05	DIODE	1N4005	
D108	8-719-904-05	DIODE	1N4005	
D109	8-719-904-05	DIODE	1N4005	
D110	8-719-904-05	DIODE	1N4005	
D201	8-719-061-02	DIODE	PR1003	
D202	8-719-510-73	DIODE	UF3DL	
D204	8-719-027-20	DIODE	SB340L	
D205	8-719-058-08	DIODE	BZX85C51	
D206	8-719-061-02	DIODE	PR1003	
D207	8-719-061-02	DIODE	PR1003	
D301	8-719-510-73	DIODE	UF3DL	
D302	8-719-018-83	DIODE	D2S4M	
D303	8-719-723-97	DIODE	MTZJ18	
D305	8-719-911-19	DIODE	1SS119	
D306	8-719-911-19	DIODE	1SS119	
		< FUSE >		
⚠F101	1-533-296-11	FUSE HOLDER	2A/250V	
		< IC >		
IC201	8-759-420-19	IC AN1431T		

Note :
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Note :
Les composants identifiés par une marque ⚠ sont critiques pour la sécurité.
Ne les remplacer que par une pièce portant le numéro spécifié.

POWER BLOCK

Ref. No.	Part No.	Description		Remarks
		< COIL >		
⚠L101	1-416-929-11	INDUCTOR		
		< PHOTOCOUPLER >		
⚠PC101	8-749-014-24	PHOTOCOUPLER	ON3131	
		< TRANSISTOR >		
Q101	8-729-904-98	TRANSISTOR	2SC1054	
Q102	8-729-012-31	TRANSISTOR	2SC4040	
Q301	8-729-018-99	TRANSISTOR	2SD2394	
Q302	8-729-920-70	TRANSISTOR	2SC1740	
Q303	8-729-018-99	TRANSISTOR	2SD2394	
Q304	8-729-119-79	TRANSISTOR	2SC2785	
Q305	8-729-040-88	TRANSISTOR	2SB1240	
Q306	8-729-920-70	TRANSISTOR	2SC1740	
Q307	8-729-231-11	TRANSISTOR	2SA1015	
		< RESISTOR >		
⚠R101	1-219-779-51	RESISTOR	6,8M	1/2W
R201	1-260-313-51	CARBON	56	1/2W
⚠R204	1-219-123-11	FUSE RESISTOR	0,47	1/4W
R208	1-260-304-51	CARBON	10	1/2W
⚠R209	1-202-958-11	FUSE RESISTOR	2,7	1/4W
		< VARISTOR >		
⚠Z101	1-801-445-31	VARISTOR	S10K150	

Ref. No.	Part No.	Description	Remarks
		MISCELLANEOUS	
		**********	
10	1-418-341-11	SWITCH BLOCK, CONTROL (999HF)	
10	1-418-341-21	SWITCH BLOCK, CONTROL (M11HF)	
10	1-418-341-31	SWITCH BLOCK, CONTROL (M91HF)	
30	1-790-578-11	CABLE,FLAT (FFM-28)	
31	1-790-579-11	CABLE,FLAT (FFM-29)	
⚠55	1-468-401-11	POWER BLOCK	
59	1-779-725-11	CONNECTOR, BOARD TO BOARD 5P	
⚠61	1-783-605-12	CORD, POWER 125V 7A (M11HF/M91HF)	
⚠61	1-790-293-11	CORD, POWER 125V 10A (999HF)	
704	1-500-144-11	HEAD,FE	
833	1-766-723-21	CONNECTOR, BOARD TO BOAR 3P	
M902	1-698-971-11	MOTOR,DC (CAPSTAN)	
M903	X-3947-577-1	MOTOR ASSY (LOADING)	
S101	1-762-844-21	SWITCH, ROTARY	

ACCESSORIES

****

1-418-154-31	COMMANDER, STANDARD(RMT-V267B) (M11HF)
1-418-376-11	COMMANDER, STANDARD (RMT-V278) (M91HF)
1-418-377-11	COMMANDER, STANDARD (RMT-V280) (999HF)
1-696-592-11	CORD,CONNECTION (NTSC)
1-775-454-21	CORD,CONNECTION
1-776-258-11	CORD,AVC CONNECTION
1-783-325-11	CORD,CONNECTION (CABLE MOUSE)
3-709-044-01	COVER,BATTERY (FOR RMT-V278)(M91HF)
3-709-126-01	COVER,BATTERY (FOR RMT-V280)(999HF)
3-709-128-01	COVER,BATTERY (FOR RMT-V267B)(M11HF)
3-972-783-21	RING,JOG
3-972-850-01	BUTTON, FUNCTION
3-973-077-31	RING,CHANGE SPEED
3-865-761-11	MANUAL, INSTRUCTION (ENGLISH)(999HF)
3-865-761-21	MANUAL, INSTRUCTION (FRENCH)(999HF)
3-865-760-11	MANUAL, INSTRUCTION (ENGLISH)(M11HF)
3-865-760-21	MANUAL, INSTRUCTION (FRENCH) (M11HF:Canadian))
3-865-759-11	MANUAL, INSTRUCTION (ENGLISH)(M91HF)
3-865-759-21	MANUAL, INSTRUCTION (FRENCH) (M91HF:Canadian)

Note : The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.	**Note :** Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

9-921-726-11

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Home Video Company

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